Occasional Papers

II

THE
POPULATION OF BRISTOL

Occasional Papers, of which this is the second, will serve as a medium for the publication of several types of research results. Some, like No 1, *The New Population Statistics*, will give preliminary and partial results of studies which will later be published in full in book form. Some will bring reports up to date. Others will be small-scale, independent reports which are complete in themselves.

Occasional Papers will appear from time to time, as occasion demands, and not at regular intervals. They will vary in length. No. 1 was very brief; No. 2 is considerably longer. It is an accident that the first two to be issued both deal with population topics, for the series will not follow a planned course. By the publication of *Occasional Papers* it is hoped to make quickly available those results of our research which are of particular current interest.

THE
POPULATION OF
BRISTOL

by

H. A. SHANNON & E. GREBENIK

CONTENTS

CHAPTER I

INTRODUCTION

By Professor Hamilton Whytl

The most important single factor in any community is its population. Changes in size and composition and movements within different areas have important repercussions in many directions. Trade development, the provision of transport, public utilities, health services and a host of other activities are directly affected by changes in the numbers and character of those for whom such provision is made. Hence the first requirement in deciding policy, either in the sphere of government or trade, is to ascertain the fullest available information concerning past changes and future estimates of population. An attempt has been made to provide this data for Bristol and the surrounding district in the following pages. Mr Shannon's memorandum is divided into three sections. The first deals with the period 1861–1931. For purposes of comparison he distinguishes between the Bristol City and Bristol City Urban Cluster, the latter description being applied to the area including Bristol City, Mangotsfield U.D., Kingswood U.D., Whitchurch C.P., Bishopsworth C.P., Filton C.P. and Patchway. The second section carries the analysis down to 1938, by which time numbers are spreading beyond the cluster to the fringes. Section three constitutes a special study of the industrial immigrants since 1931, showing their origin and occupational destination. It also compares the proportions of unemployment amongst the immigrants with the total unemployed in the area. In this section the area is that covered by the Ministry of Labour Employment exchanges, Bristol, Bristol Docks, Avonmouth, Eastville, Kingswood and Westbury-on-Trym. The area is substantially the same as that of the cluster.

Changes in population within an area arise from two sources, natural fertility and net migration. As regards the resident population, numbers may continue to increase even when the rate of increase is falling, that is to say, the community is failing to reproduce itself. If this continues, numbers will move towards a stationary point and thereafter decline. This appears to be true of the country as a whole and the following studies show that Bristol is no exception. But changes due to natural fertility are affected in different areas by movements out of or into the area. The conclusion reached by these investigations on this point is that the growth of the Bristol cluster since 1861 has been almost entirely due to the fertility and natural increase of Bristolians and not to migrants. In the earlier period the cluster did gain something through net migration, but it was small compared with the natural increase and since 1901 the balance has been outwards, not inwards. The cluster as a whole has lost about the same number as it has attracted, the small balance of net emigration being accounted for by Bristolians moving their homes to more outlying regions such as Clevedon and Weston-super-Mare and the surrounding countryside.

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The second section deals with the adult population only, the object being to trace the net migration of persons aged 21 and over relating to the Bristol area between 1931 and 1938. The sources of information and the methods of co-ordination are described by the author. The more important facts which emerge are those throwing light on the changing distribution of the population within the city's expanding boundaries. The city as a whole has neither lost nor gained much in adult population through migration. There have, however, been considerable displacements between older and inner Bristol and newer and outer Bristol. The Bristol Parliamentary Borough, which covers the older and inner part of the city, lost by net migration between 1931 and 1938 over 8,000 adults. But during the same period the outer and newer area has gained by net migration over 8,600. While the total population has changed little, there has been a consistent net outward stream from the inner to the outer parts of the city. There is a significant change within this period after 1934. The three years 1931–34 show a small net inward movement of some 600 adults a year. The four years 1934–38 show a net inward movement of some 1,800 adults a year. This is clearly associated with the rearmament trade recovery and the lifting of the depression. Such a rapid immigration associated with war industry, especially in contrast to past experience, clearly raises far-reaching issues concerning the future employment of these workers on the return of peace.

On more specific matters the author tells us that in 1919 two-thirds of the elementary school population attended schools inside an area not more than $1\frac{1}{2}$ miles from the centre while one-third were outside. In 1939 the proportions were nearly reversed. Whereas 39 per cent attended schools within the $1\frac{1}{2}$ miles radius, 61 per cent were outside. Changes are also shown in the five divisions which make up the parliamentary borough. The Central has lost 10,000; the East and North are stationary; the South rose till 1934 and is now stationary, while only the West shows an increase.

In section three Mr Shannon has provided us with a most valuable study of the industrial migrants. This material and the conclusions to which it leads will repay careful study and help to correct many popular notions such as that local unemployment is produced by outsiders displacing Bristolians from their jobs. Migrants are studied in age and sex groups. Their origin and destination are traced and their fate and influence upon local economy discussed.

In July 1938 out of a total of 161,000 registered workers over 17,000 were migrants. They consisted predominantly of men of 21 and over.

Of the total insured population on this date

    72·5 per cent were males and 27·5 per cent females.

The corresponding figures for migrants were

    87·7 per cent males and 12·3 per cent females.

Taking the age group 21–64 the figures were

    Total Registered Workers: 81·0 per cent males and 56·0 per cent females.
    Migrants: 91·0 per cent males and 67·0 per cent females.

What was the destination of these incomers? Over one-half of the adult

males were absorbed in three industries, Aircraft, Building and Distribution. In view of the wide and varied range of Bristol industries it is clear that our migrants are being concentrated instead of dispersed throughout the city's trades. As will be shown later, this will intensify the problem of unemployment when depression sets in. Where have they come from? Over one-quarter came from Glamorgan and Monmouth. Another quarter from Gloucester, Somerset and Wiltshire, while only a slight proportion of the remainder can be traced to Wales or other depressed areas. This means that the movement of such migrants does not indicate the easing of unemployment in other parts of the country.

How have they fared? The attempt to answer this question leads to many interesting discoveries. Judged by their unemployment record they have fared definitely worse than the Bristolians. The percentage of unemployment amongst migrants is consistently higher in every age group than that of the home worker. Unemployment for all insured workers in Bristol at July 1938 was 8·9 per cent. The corresponding figure for migrants was 11·4 per cent. But the lowest unemployment figure for any single industry was Aircraft with only 1·4 per cent and this industry absorbed a disproportionately large number of migrants. If, therefore, we eliminate it from the total, the figures are still more striking:

All Bristolians 11·7 per cent unemployed. Migrants 16 per cent.

The distribution of migrants and their unemployment record is then traced throughout the leading industries. The significant feature is the large number absorbed by Aircraft followed by Building and Distribution. The same fate attends them when divided into age and sex groups. On this point I quote Mr Shannon's conclusion in full: 'It is disturbing to find that Bristol's attractive and absorbing power is so largely to be explained by a single industry and that a precarious one. The rise of the aircraft industry is the most striking feature of Bristol's industrial development in recent years— indeed, it may be said to be that development. Although it has told in reducing unemployment it has not told as much as might be expected in causing a more general and diversified expansion throughout the range of Bristol's localized industries. This lack of generalized secondary expansion, save perhaps in the building trade, no doubt explains the low rate of absorption in Bristol's older industries.'

This was written before the outbreak of war. The immense dislocation now taking place is in the main intensifying this mal-distribution of labour. The depletion of the distributive trades which normally absorb much migrant labour is operating in the opposite direction, but it is clear already that the mushroom growth of aircraft employment is attracting an abnormal population to this area which will present a serious problem as soon as war demand ends. If it were possible to investigate the skill and employable capacity of these migrants, it is not unlikely that this would prove to be lower than that of locally employed labour.

Enough has been stated to show the value of this study to all who are interested in the future welfare of Bristol's workers, and the immense problem

of post-war reconstruction should be studied against the illuminating back-ground here provided.

By a stroke of good fortune it is possible to supplement this study of the past by a reliable estimate of the future population of Bristol. One important discovery made in the course of the Bristol Social Survey in 1938 was the fact that the Bristol Medical Officer of Health had a record over a period of years of the age of the mother for every daughter born. From this it is possible to estimate the net reproduction rate of the local population and thus forecast the trend. Mr Grebenik, who is an expert in this field, has analysed the data and written up the results. This appears as Chapter III, 'Some Aspects of Population in Bristol'. This paper was first published in the *Journal of the Royal Statistical Society*, Part 3, 1940. The Royal Statistical Society have kindly given permission for it to be incorporated in the present publication. Mr Grebenik has kindly re-written his article in less technical language and this also is published here as a summary in Chapter IV. He first compiles a life-table of the Bristol population which shows that the survival age of Bristol inhabitants compares favourably with that for the whole country. Thereafter follow the estimates of future numbers on the assumption that fertility and mortality remain at the same level as 1937. The total population then was 415,000. This will continue to rise till the maximum is reached between 1942 and 1949 round 417,000. Thereafter it will begin to decrease so that by the year 2002 the population will be only 273,000. Another interesting table estimates the future of the school population, children between the ages of 5 and 14. This is shown for every five years. The total number will fall from 61,200 in 1937 to 29,100 in 2002. The important influence of such decreases upon the provision of social services and educational facilities are too obvious to call for elaboration. The figures are next studied from the standpoint of different classes and the conclusion is reached that the greater part of the increase in the population is due at the present time to the unskilled labourer. The author sums up as follows:

'While the impact of the war may lead to some modification in the con-clusion of these pre-war studies, the prevailing long-term trends which they reveal will still carry important implications. Amongst the more obvious are:

(i) Approach of a stationary or declining population.

(ii) Variations in fertility habits of different social classes.

(iii) Changes within local areas due to the operation of migratory forces attracted by new industries.'

CHAPTER II

MIGRATION AND THE BRISTOL AREA

By H. A. SHANNON

§I. HISTORICAL SURVEY, 1861–1931

The present report falls into three parts: first, an historical survey covering 1861–1931; second, estimates of the more recent movements 1931–38; and third, a detailed study of the migration of labour as revealed by the Ministry of Labour count of books in July 1938. The first two parts relate to the population as a whole and the third to insured workers under the Unemployment Insurance Acts.

1. *The historical background*

There are two main difficulties in the historical study of migration in respect of a local area. First, there are the usual difficulties arising from changes of boundaries. In the present case these are not unusually serious and can be substantially overcome by grouping registration sub-districts and administrative areas. Secondly, there is the difficulty that with a relatively small population as the basis the more refined methods of estimation (such as the use of death-rates) are not reasonably applicable and we must fall back on the simpler method of comparing the observed increases with natural increases. This method merely gives us net migration, and not the gross movement both in and out. Moreover, for the same reason—the smallness of the base—little refined use can be made of the birth-place particulars in the older censuses, and in the case of Bristol any attempt to use them is greatly complicated from Bristol's being situated in *two* geographical counties (Gloucester and Somerset). We must be content with broad answers of a net kind.[1]

What may reasonably be called the Bristol Urban Cluster is to-day composed of (1) Bristol City, which forms the nucleus, and (2) Mangotsfield U.D., Kingswood U.D., Whitchurch C.P., Bishopsworth C.P., Filton C.P., and part of Almondsbury C.P., namely Patchway, which form the fringes. The cluster so defined is co-terminous with the area of the Bristol Social Survey. Our task is to estimate the past population of the area and its subdivisions and to estimate the historical migration from 1861.

The present city and county borough of Bristol has grown from the ancient city (a 'county of itself' since 1373) by four major extensions—the extensions of 1835, of 1897, of 1904 and of 1933–35. In addition there have been five minor extensions, all of a more or less technical and special nature involving minute immediate additions to the population though in some cases adding considerably to the area of the city. They took place in 1895, in 1901–2, in 1918, in 1926 and in 1930.

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1 For a detailed discussion on the use of the census particulars (especially birth-places) and of death-rates in estimating migration (gross and net) see my 'Migration and the Growth of London' (*Economic History Review*, 1935).

The population of the city, as constituted in 1931, can be obtained for 1871–1931 from the census of 1931 and, subject to a small adjustment, for 1861 from the census of 1921. The populations of 1921 and 1931 in the areas added 1933–35 are given in the second volumes of the census of 1931 and for the preceding years (1861–1911) can be estimated with quite high accuracy.

The urban district of Mangotsfield is substantially the ancient civil parish of that name and its population is easily estimated backwards, requiring two adjustments. The urban district of Kingswood is a modern creation and its population is estimated for 1861–71. Whitchurch is an ancient parish and has been little affected by boundary changes involving population. Bishopsworth is a modern creation and its population is estimated for 1861–81. Filton is an ancient parish and, like Whitchurch, has an almost continuous record. Patchway had an estimated population of 500 in 1937; its growth is almost entirely a matter of the last few years and in the historical aggregate it is negligible.

Subject to the above remarks, the following tables give comparable figures of the population growth of the Bristol urban cluster:

TABLE I (a).   Bristol only

Boundaries	1801	1811	1821	1831	1841	1851
Ancient city	40,814	46,592	52,889	59,074	64,266	65,716
Added 1835	20,339	24,841	32,219	45,334	60,880	71,612
City of 1835	61,153	71,433	85,108	104,408	125,146	137,328

TABLE I (b).   Bristol Urban Cluster

Boundaries	1861	1871	1881	1891	1901
Ancient city	66,027	62,806	57,479	55,549	45,836
Added 1835	88,066	119,890	149,395	166,029	178,177
City of 1835	154,093	182,696	206,874	221,578	224,013
Added 1895–1930	22,076	33,425	53,534	74,827	115,137
'City of 1904'	176,169	216,121	260,408	296,405	339,150
Added 1933–35	2,800	2,900	3,100	3,100	3,400
City of 1935	179,000	219,000	263,500	299,500	342,500
Fringes	11,000	11,800	13,800	17,000	22,500
Total: Cluster	190,000	231,000	277,500	316,500	365,000

TABLE I (c).   Bristol Urban Cluster

Boundaries	1901	1911	1921	1931	1937†
'City of 1904'*	339,150	357,173	377,018	397,012	.
Added 1933–35	3,400	4,900	5,418	6,936	.
City of 1935	342,500	362,000	382,436	403,948	415,100
Fringes	22,500	25,000	26,000	31,000	37,250
Total: Cluster	365,000	387,000	408,500	435,000	452,350

* The title 'city of 1904' is a slight misnomer as it includes the three minor adjustments of boundaries 1918–30, but these are very small.
† The 1937 figures are based on the Registrar-General's estimates.

It is convenient at this point to form a rough geographical picture of the major movements of the city boundaries up to the present time and of the fringe in relation to the city nucleus. The extension of 1835 formed a nearly concentric ring round the ancient city and effectively brought the boundary

on the west up to the Avon Gorge. Any further extensions directly westward of the city as constituted in 1835 have been barred by the Gorge, and the same barrier has kept the population over the river there quite thin. The extensions of 1897–1904 in their turn formed a ring round the city of 1835 except west of the Gorge but with an outlier towards Shirehampton and Avonmouth. The Somerset extension of 1933 broadened this ring to the south and the Gloucester extension of 1935 effectively completed it to the north and broadened the older outlier of Shirehampton and Avonmouth to the Channel. Filton and Patchway form a northward-pointing salient to the city of to-day. Mangotsfield and Kingswood form a broad zone to the east. Whitchurch and Bishopsworth form another zone to the south. It is reasonable, if rough, to describe the general march of the boundaries from the ancient city to the edge of the cluster as forming concentric rings, except to the direct west.

In the light of this it is interesting and instructive to study the intercensal increases of the various zones and of the various nuclei or cores made up from them. What have been their relative growths and how are these related to the march of the city boundaries? The following table presents the relevant figures of Table 1 in percentage form, though in some cases the decimal values cannot be pressed where the original figures are approximate:

TABLE 2.   Components of Bristol Urban Cluster—Intercensal increases

Intercensal increases as percentages

	Ancient city	Added 1835	City of 1835	Added 1897–1904*	'City of 1904'	Added 1933–35	City of 1935	Fringe	Total Cluster
1801–11	14·2	22·2	16·8	.	.	.	.	.	.
1811–21	13·5	29·7	19·1	.	.	.	.	.	.
1821–31	11·7	40·7	22·7	.	.	.	.	.	.
1831–41	8·7	34·3	19·8	.	.	.	.	.	.
1841–51	2·3	17·6	9·7	.	.	.	.	.	.
1851–61	0·5	22·9	12·2	.	.	.	.	.	.
1861–71	− 5·1	36·1	18·5	51·5	22·7	3·5	22·3	7·3	21·5
1871–81	− 9·2	24·6	13·2	60·2	20·5	6·9	20·3	16·9	20·1
1881–91	− 3·5	11·1	7·6	39·8	13·9	0·0	13·7	23·1	14·0
1891–01	−17·5	7·4	0·6	53·8	14·5	9·6	14·4	32·3	15·3
1901–11	.	.	.	.	5·3	44·1	5·7	11·1	6·0
1911–21	.	.	.	.	5·5	10·6	5·6	4·0	5·5
1921–31	.	.	.	.	5·3	28·0	5·6	19·2	6·5

* Including the five very minor additions of 1895, 1901–2, 1918, 1926 and 1930.

The general lessons from this table are plain and confirm expectations.

The ancient city at the beginning of the nineteenth century grew at its accustomed pace but, naturally, did not increase its rate of growth. Then a decline in rate set in and this was followed, from the mid-century, by an absolute decline. The very centre became de-populated both relatively and absolutely. The concentric ring added in 1835 showed a rapid and accelerating rate of growth before its incorporation, which increase no doubt was a cause of its incorporation; but the rate of increase, like its predecessor of the ancient centre, began to decline remarkably round the mid-century, and whilst it picked up between 1861 and 1871 it was declining, though still yielding an absolute increase, as the century wore on. But while the ancient city, the

innermost area, was declining and the addition of 1835, now an intermediate area, was slackening in growth, an outer ring—substantially incorporated in 1897 and 1904—was growing rapidly; and again no doubt this increase was a main reason for its incorporation. Even so the city substantially as it was constituted in 1904 was slackening in aggregate growth, the rate of growth in the additions of 1897–1904 not being sufficient really to offset the movements within the boundaries of 1835. Three stages are clearly seen—the stages of 1861–81, of 1881–1901 and 1901–31. The area added in 1933–35 had a sudden spurt in 1901–11 (especially in the Brislington part) and its recent rapid rise is obvious. As these latest additions are rather small absolutely, the proportionate growth of the city within its bounds of 1935 is virtually the same as the growth of the city within, virtually, its bounds of 1904. The outermost area—the salient of Filton and the zones of Mangotsfield-Kingswood and of Whitchurch-Bishopsworth—shows a large and rapid proportionate growth for 1871–1901 which slackens off towards, and falls away in, the War period, but its recent rapid rise is also clear. The cluster as a whole naturally follows closely the trends of the city, either of 1904 or of 1935.

In short, long before the boundary changes in 1835 and in 1897 recognized the fact, the city had grown beyond its borders. In the change in 1904, growing isolated districts were brought in together with a great area of country which was not then developed. In the most recent changes (1933–35) the land brought in has mostly been undeveloped, and within the city boundaries to-day we have an unusually large proportion of land which is still agricultural.

Before leaving this topic we can make another interesting and instructive comparison, this time with the wider fringe of Gloucester and Somerset and with the country as a whole. In the following table the intercensal percentage increases of the city of 1835 are compared, for 1801–61, with those of Gloucester-and-Somerset exclusive of the city and with those of England and Wales; and the percentages of the cluster as a whole (themselves very similar to those of modern Bristol) are compared, for 1861–1931, with those of Gloucester-and-Somerset exclusive of the cluster and with those of England and Wales.

TABLE 3.   City, Cluster, Gloucester-and-Somerset, England and Wales—Intercensal increases

Percentage movements

	City of 1835	G. & S. less City	E. & W.			Cluster	G. & S. less Cluster	E. & W.
1801–11	16·8	11·7	14·0		1861–71	21 5	3·5	13·2
1811–21	19·1	17·3	18·1		1871–81	20·1	−0·4	14·4
1821–31	22·7	13·2	15·8		1881–91	14·0	0·5	11·7
1831–41	19·8	8·0	14·3		1891–01	15·3	1·4	12·2
1841–51	9·7	3·1	12·7		1901–11	6·0	3·6	10·9
1851–61	12·2	1·5	11·9		1911–21	5·5	0·9	4·9
					1921–31	6·5	1·5	5·5

The city or the cluster, as the case may be, is seen greatly to have outstripped its surrounding county fringe from at least 1821, though the differential is much less in the present century. It is barely an exaggeration to say that that county fringe has remained stationary for the last hundred years. The city

and the cluster compare favourably enough with the country as a whole. Throughout the nineteenth century a marked superiority in growth was shown except in the decades 1841–61. There is a serious discrepancy in 1901–11, but since 1911 both the modern city and the cluster have kept pace with the country generally.

So much then by way of summary and comparison through general population statistics. How far have these movements been brought about by the fertility of Bristolians and how far by migration? What has been the relative importance of the two factors of natural increase and migration?

2

In seeking to build up the growth of the city and the area through the balance of births and deaths and of net migration we meet the usual statistical difficulties. None of the registration districts or other units quite correspond to the city or the cluster. But approximate answers can be obtained. We can use registration sub-districts until their (virtual) supersession in 1911 and thereafter we can combine the new administrative areas.

Between 1861 and 1891 the relevant thirteen registration sub-districts suffered no change of boundaries except one small change (population = 296) in 1884 which did not affect the total area and a census adjustment of figures (= 144) between the censuses of 1871 and 1881 which did add to the total. In 1895–97 a few changes took place between the sub-districts (= 311) and two changes altered the external boundary to a negligible extent (gain = 431, loss = 600). With this net difference the total area of the thirteen sub-districts remained unchanged for 1861–1901. But in the decade 1901–11, and especially in 1909, the sub-districts were re-constituted and a population of 2,782 was transferred to other sub-districts outside our area. It will be seen that the area built up from the original thirteen sub-districts remains virtually unchanged for 1861–1911, and the effects of the small changes can be easily allowed for without risk of any serious error. Of the thirteen sub-districts, twelve jointly approximate to the present city and one substantially contains the modern Kingswood U.D. and Mangotsfield U.D.

By this device we can obtain enumerated particulars of births and deaths for an area composed primarily of the city and the cluster, and we can derive the required figures by proportion from the populations.[1] The migration figures can then be derived in the usual way. For the period 1861–1911 the following tables sum up the enumerations and the final results, a later table based on administrative areas carrying the study on for 1921 and 1931.

The differences between the estimated migration for the cluster and the city are due to movement to and from the non-city fringe and are principally accounted for by observed differences in Mangotsfield and Kingswood.

[1] A partial check can be had for 1901–11. As constituted in 1911 the city had a population of 357,114 and for the decade 1901–11 had a natural increase of 38,968. As constituted in 1935 it is here estimated to have had a population of 362,000 and to have had a natural increase of 39,600. When allowance is made for the difference in population itself, this partial check suggests that the calculations may be correct to a few hundred.

TABLE 4.   Comparative population of districts, City and Cluster

	1861	1871	1881	1891	1901*		1911
13 Sub-districts	193,151	234,182	281,322	318,921	367,074	364,292	384,339
Cluster	190,000	231,000	277,500	316,500	365,000		387,000
12 Sub-districts	183,060	223,234	268,374	302,837	346,307	343,525	361,703
City of 1935	179,000	219,000	263,500	299,500	342,500		362,000

* With and without the alteration of 2782

TABLE 5 (*a*).   Natural increase and migration

	1861–71	1871–81	1881–91	1891–1901	1901–11
			Natural increase		
13 Sub-districts	24,607	39,395	42,528	43,695	42,874
Cluster	24,200	38,800	41,900	43,400	42,900
12 Sub-districts	22,781	36,893	39,808	40,207	39,684
City of 1935	22,300	36,200	39,100	39,700	39,600
			Net migration		
Cluster	16,800	7,700	−2,900	5,100	−20,900
City of 1935	17,700	8,300	−3,100	3,300	−20,100

With the supersession of the registration districts from 1911 this method ceases. In the census of 1921 only two of the components of the area are available with the relevant figures, namely, Bristol C.B. and Kingswood U.D. In the census of 1931 three components have the relevant figures, but with the added difficulty in comparability that the populations are the officially estimated *resident* population for the mid-year, not the census enumerated population as heretofore. The three areas are Bristol, Kingswood and the newly created Mangotsfield U.D. However, it is possible to estimate for the remaining areas. Thus, the areas added to Bristol in 1933–35 had a population of some 4,900 in 1911 and 5,418 in 1921—which when natural increase is remembered suggests that net migration was quite negligible. The fringes less Kingswood and Mangotsfield had a population of some 2,300 both in 1911 and 1921—which suggests that the net outflow was very small, a matter of a hundred or two. It is obviously different in the decade 1921–31. The added areas increased from 5,418 to 6,936—which suggests a net inflow of (say) 1,000. The fringes less Kingswood and Mangotsfield increased from 2,300 to 6,500— which suggests a net inflow of (say) 3,800. For the three administrative areas in the decade 1921–31 the census authorities estimated migrational movements from the estimated resident populations, taking these as more stable and appropriate for their purposes than the enumerated. For these three areas we may follow them, ignoring the breach in formal comparability, but for the added areas and the balance of the fringes we must work from the enumerated populations. The following table results:

TABLE 5 (*b*).   Natural increase and migration

	Natural increase		Net migration	
	1911–21	1921–31	1911–21	1921–31
Bristol C.B.	25,119	19,942	−5,258	−2,278
Added areas 1933–35	400*	400*	100*	1,000*
Kingswood U.D.	1,190	648	− 939	− 548
Mangotsfield	650*	514	0*	442
Rest of fringes	200*	300*	− 200*	3,800*
Cluster, approximately	27,500	21,800	−6,300	2,400

* Estimated

Thus, the net outward movement was checked in the post-war decade and indeed became slightly inward. If the decade 1921–31 is worked out consistently on enumerated populations and the complications of resident populations ignored, the above net inflow of some 2,400 would rise to some 4,800. Bristol C.B., for example, would then have a net inflow of 52.

We can now sum up the results of Tables 5 (*a*) and (*b*), and describe the main facts and currents of the historical net migration 1861–1931.

It is clear that the 1860's witnessed a strong inward flow resulting in a net gain of some 17,000–18,000. In magnitude the city's net gain by migration was somewhat comparable to the natural increase. The effect is clearly seen in the jump in the intercensal increase of the city within its then boundaries (Table 2). The current in its net form slackened in the 1870's quite considerably and in the 1880's had died away, and indeed it reversed its direction. In the 1890's the net flow was small and inwards, though the fringes of the then city drew a much more than proportionate share, as can be seen in their intercensal increase. But the new century opened dramatically with a net outward flow of some 20,000—for the city, amounting to no less than half the natural increase of the new decade and more than double the intake from the extension of boundaries in 1904. This great exodus explains the slow growth of the city and the cluster in 1901–11, when Bristol itself grew at only half the rate for the country as a whole. The decade of the War saw the net outward flow reduced to one-third, and in 1921–31 the flow had become a mere trickle. The exodus was over.

Finally, it can be seen that Bristol itself in the seventy years 1861–1931 had a total natural increase of some 223,000 as above. Migration, as represented by its net form, over the seventy years 1861–1931 resulted in a trifling gain, say 2,000 on the enumerated figures. The following table splits up the intercensal percentage increases between the two factors:

TABLE 6.   Bristol: Intercensal growth by natural increase and net migration

Percentage movements*

	1861–71	1871–81	1881–91	1891–1901	1901–11	1911–21	1921–31
Natural increase	12·3	16 5	14·8	13·3	11 5	7 1	5 3
Net migration	10·0	3·8	−1·1	1·1	−5·8	−1·5	−0·6
Total	22 3	20·3	13·7	14 4	5·7	5 6	4·7

* For 1861–1911, the city as estimated within its bounds of 1935; for 1911–31, the city as at the census dates, and for 1921–31, resident population. The break in comparability is here likely to be very small.

A brief note on the city's own subdivisions may be worth its place. The ancient city lost steadily through net migration: between 1861 and 1901 it had lost some 35,000 and in 1901–11 the combined area of the ancient city and Clifton lost some 12,500. Clifton itself had been losing from the 1870's. Another great loser was St Philip: between 1871 and 1901 it had lost almost 24,000 and in 1901–11 the combined area of St Philip and St George lost some 15,000. But St George by itself was historically a gainer. The great areas of consistent attraction, with a net inflow, were Bedminster, Ashley, St George, Westbury and Stapleton. Indeed in the decade 1901–11, when the rest of the registration area lost some 33,000, the Knowle part of Bedminster, Ashley,

Westbury and Stapleton gained some 13,000—so curious are the cross-currents of migration.[1]

These studies, therefore, give us the answers to the question, 'To what has the growth of the Bristol cluster been due?' Since 1871 it has been almost entirely due to the fertility and natural increase of Bristolians and not to the area's power to attract migrants. In the decades when the cluster did gain something through net migration, the gain was small compared with the natural increase, and since 1901 the balance has been outwards, not inwards. The net loss in the decade 1901–11 was substantial and amounted to half the natural increase. Since then the gain has been small and in the decade 1921–31 the whole cluster may be said to have had about as many people leaving it to take up their residence elsewhere as it has had people coming to live in it. The small balance of net emigration on the basis of resident figures was probably not larger than would be accounted for by middle class and other Bristolians moving their homes to the surrounding countryside or to towns like Clevedon and Weston-super-Mare. Substantially, then, in the decade 1921–31 the migratory balance was even.

What has happened since 1931 is the subject of a special study in the next section.

§ II. ADULT MIGRATION, 1931–38

The purpose of the present section is to estimate the net migration of persons aged 21 and over in respect to the Bristol area, 1931–38.

The principle behind the estimation is simple, but its detailed application is very involved. Broadly, from the census particulars of ages and from the particulars of deaths from the vital statistics we compute the population aged 21 and over as it would be at 1st June in each year from these causes; next we compare these computed figures with the observed numbers on the (parliamentary) electoral roll, and treat the final differences as a measure of the migration of persons aged 21 and over. Subject to obvious qualifications this amounts to handling the Bristol area as a closed community for purposes of calculating, first, what the annual inflow to the electoral roll would be from the annual coming of age of the census population under 21 and, secondly, what the annual 'outflow' from the electoral roll would be from the deaths of electors aged 21 and over. These calculations, with the basic census figures, give us, approximately, what may be called the biologically determined electoral roll abstracting from migration. But, annually, we have the observed numbers on the electoral roll. Having allowed for the (biological) entrants to and exitants from the roll, any great difference between the computed and the observed figures must be caused by a balance between immigrants and emigrants.

The details are much more complicated. The area of the Bristol cluster as defined in § I above is Bristol C.B., Mangotsfield U.D., Kingswood U.D., Whitchurch C.P., Bishopsworth C.P., Filton C.P. and part of Almondsbury

[1] The references here are all to the registration sub-district areas under the different titles. Owing to the great re-arrangement in 1909 it is not possible to give comparable figures after 1911.

C.P. (namely, Patchway). Patchway is not an administrative area; there are no or few figures available for it, any estimates would be rather unduly guessed, and consequently Patchway is omitted. Patchway is very likely a centre of inward migration, with an inflow of some hundreds. Except Kingswood, the other areas have been affected by boundary changes which must be allowed for. Adequate particulars of deaths are available only for Bristol C.B. and, consequently, estimates have had to be made for the other areas. Fortunately, all the estimates relate to figures which are absolutely very small and are very unlikely to involve any serious error. Except for the parliamentary borough of Bristol, the electors in each area had to be derived from a scrutiny of the electoral rolls themselves.[1]

For the three administrative areas of Bristol C.B., Kingswood U.D. and Mangotsfield U.D., the census gives the population at the relevant ages in 1931; for the three parishes of Whitchurch, Bishopsworth and Filton, the figures were obtained by proportion from the rural districts of which they form a part. In this way we obtain the populations at each age 13 to 20 (last birthday) on the census date, 26/27th April 1931, approximately one month ahead of the compilation of the electoral roll, which is 1st June of each year. Thus, taking those aged 15 last birthday at the date of the census, we may argue that a twelfth of these would be aged 16 by the 1st June, which twelfth must be subtracted, and that a twelfth of those aged 14 would be aged 15 by 1st June, which twelfth must be added, and so in this way we would have the numbers aged 15 on the 1st June 1931. The survivors of those thus 15 would attain the age 21 and their franchise by June 1937 and would represent the (biological) inflow to the electoral roll in that year. And, *mutatis mutandis*, for the other ages. Equally, year by year, the deaths of those aged 21 and over form the (biological) outflow from the electoral roll. As the deaths are given by the calendar year and the electoral roll dates from 1st June to 1st June, seven-twelfths of the deaths of one year have to be added to five-twelfths of the deaths of the next to give the deaths of the years ending June. For the population aged 21 and over, one month's deaths were allowed for to bring the census date and the electoral roll date into line in 1931, but no correction was similarly made for the deaths over the month in the age group below 21, for their deaths were too small to be significant. And so on.

1. *Bristol P.B. and Bristol C.B.*, 1931–38

For Bristol C.B., four sets of calculations needed to be made. The main set related to the parliamentary borough itself, that is, the city within its boundaries of 1918. The other three sets related to the additions of 1918–30, of 1933 and of 1935. The preliminary age grouping for the additions of 1918–30

1 An illustration of the muddle of boundaries may be given: the parliamentary borough of Bristol differs from the county borough, the Town Clerk is registration officer only for the parliamentary borough, for which he collects particulars both of the parliamentary and local electors, consequently neither he nor any other authority in Bristol C.B. has a complete list of local government voters in Bristol C.B., and the balance of these voters must be obtained, as circumstances may require, from the registration officers at Gloucester and at Taunton. There is nowhere in Bristol C.B. a complete list of its local government voters, not even in the Town Archives.

I am indebted to Mr W. King for much help in counting and scrutinizing these rolls.

had to be obtained by proportion from the particulars of the city as con-
stituted in 1931, and for the additions of 1933 and of 1935 from the Registrar-
General's Annual Reviews. Their relevant deaths were all obtained by propor-
tion from the city figures, due care being taken to avoid double counting and
other complications following the boundary changes. Both the basic figures and
the adjustments are all absolutely small and cannot contain any serious error.

The boundary changes have had this advantage to the study: they enable
us to compare the (net) migrational effects on an inner area, the boundaries
of the city as at 1918, and on a fringing area, composed of the additions since
that date. All the recent changes are in keeping with the historical lessons set
out in § I above; the historical trends are continuing in the same direction.
The more inner cores and zones of the city are slackening in growth, even
to the point of relative de-population, and more and more the population
spreads out towards the fringes and into the surrounding country. The
population of the city is not increasing much, indeed like many others it may
be said to be substantially stationary, but it is deserting its older settlement
and site and seeking fresh pastures.

The following tables sum up the results of the calculation for the parlia-
mentary borough (that is, the city within its boundaries of 1918). Later tables
carry on the study for the immediate fringe (that is, the additions of 1918–30,
of 1933 and 1935) which completes the city of to-day, and for the two together,
thus giving Bristol C.B. The tables give the figures as calculated but, as is
obvious from the above account of estimating, they should all be rounded
off to, at least, the nearest hundred.

TABLE 7.   Estimated population aged 21 and over and
registered electors, Bristol P.B., 1931–38

June	Estimated population aged 21 and over			Parliamentary electors* (residence qualifications only)		
	M	F	T	M	F	T
1931	118,699	144,977	263,676	117,041	141,569	258,610
1932	119,989	146,477	266,466	118,370	143,048	261,418
1933	121,268	147,835	269,103	119,673	144,106	263,779
1934	122,602	149,330	271,932	120,658	144,989	265,647
1935	123,883	150,810	274,693	121,305	145,542	266,847
1936	125,009	152,081	277,090	121,684	145,688	267,372
1937	125,825	152,814	278,639	122,138	145,558	267,696
1938	126,526	153,533	280,059	121,813	144,869	266,682

* 'Absent voters' all deemed men and included.

Thus, in 1931–32 the estimated population aged 21 and over increased by
2,790, which on the assumptions made represents the biologically determined
increase to the electoral roll. But the observed increase in the electoral roll
was 2,808. Therefore, as a *mere* matter of arithmetic, that year shows a net
inward migration of 18. Equivalently, the next year (1932–33) shows a net
outward migration of 276. The increase in the electoral roll fell short of the
increase in the relevant estimated population by that number. And so on.
By comparing the annual differences in the estimated population with the
annual differences in the electoral roll we obtain a measure of the annual (net)
migration of adults. We may fairly assume that the efficiency of the registration

of electors remains constant. A little nest of complications of the following types may safely be ignored: if an adult migrant arrived in (say) July and died before the next June, he would appear as a debit item among the deaths but nowhere as a credit item among the electors; if a migrant aged (say) 19 arrived in 1935 and survived into or beyond 1937, he becomes a credit item in the electoral roll two years after his arrival; and so on. Comparison between the differences of the estimated population aged 21 and over and of the observed electors year by year give us the best possible estimates of net annual migration of adults.

The following table sums up the relevant annual differences:

TABLE 8.   Annual changes in the estimated population aged 21 and over and in the parliamentary electors, Bristol P.B., 1931–38

June-June	Men		Women		Total	
	Population	Electors	Population	Electors	Population	Electors
1931–1932	1,290	1,329	1,500	1,479	2,790	2,808
1932–1933	1,279	1,303	1,358	1,058	2,637	2,361
1933–1934	1,334	985	1,495	883	2,829	1,868
1934–1935	1,281	647	1,480	553	2,761	1,200
1935–1936	1,126	379	1,271	146	2,397	525
1936–1937	816	454	733	−130	1,549	324
1937–1938	701	−325	719	−689	1,420	−1,014

The war-time fall in births is now telling on the annual (biological) increase of population aged 21 and over. The fall-off in the annual growth of the electoral roll and its present actual decline is principally due to (net) migration out of the parliamentary borough.

The following table, derived from the differences in the annual changes shown above, gives the estimated annual net migration in respect to Bristol P.B.:

TABLE 9.   Estimated annual net migration of persons aged 21 and over, Bristol P.B., 1931–38

June-June	Men	Women	Total
1931–1932	39	− 21	18
1932–1933	24	− 300	− 276
1933–1934	− 349	− 612	− 961
1934–1935	− 634	− 927	−1,561
1935–1936	− 747	−1,125	−1,872
1936–1937	− 362	− 863	−1,225
1937–1938	−1,026	−1,408	−2,434
Total	−3,055	−5,256	−8,311

We, therefore, reach the major conclusion that in the last seven years the parliamentary borough of Bristol, the large inner core of the city, has lost some 8,000 or more adults by net migration.

Before going on to the problem of the fringes of Bristol P.B. we may pause here to consider two other pieces of evidence. The first is slightly impressionist. In 1919, two-thirds (67·4 per cent) of the elementary school population attended schools inside an area with a radius of 1½ miles round the centre and one-third (32·6 per cent) attended schools outside that radius. In 1939, the percentages were almost completely reversed. At present, just over one-third

(38·8 per cent) attend schools within the 1½ mile radius and just under two-thirds (61·2 per cent) attend schools outside that radius.

The second piece of evidence relates to the changes within the parliamentary borough itself. The parliamentary borough is divided into five divisions— Central, East, North, South and West. The Central Division lies, like a trefoil leaf, in the centre. It includes a good deal of older Bristol. The East Division stretches out from it fairly due east towards Kingswood. The North stretches out more nearly north-east, and completes with the East Division the eastern half of the borough north of the river. The so-called West lies more directly north of the western part of the Central to Westbury, but also swinging west to Avonmouth and the Channel. The South lies south of the river and quite fairly south of the trefoil-shaped Central. The following table gives the total electors of each division:

TABLE 10.   Parliamentary electors by divisions (residence qualifications only), Bristol P.B., 1931–38

June	Central	East	North	South	West	Total
1931	42,684	47,583	50,092	52,892	65,359	258,610
1932	41,079	47,688	50,115	54,961	67,575	261,418
1933	40,367	47,863	50,380	56,184	68,985	263,779
1934	39,073	48,230	50,293	57,238	70,813	265,647
1935	37,266	48,619	50,210	57,869	72,883	266,847
1936	35,593	48,673	50,057	57,950	75,099	267,372
1937	34,156	48,782	50,037	57,879	76,842	267,696
1938	32,292	48,462	50,045	57,608	78,275	266,682

Thus, Central has fallen by some 10,000; the East and North are virtually stationary; the South rose until 1934 and has since become stationary; and only the West shows steady increase. It is not possible to calculate annual inflows and outflows for these areas, but the figures as they stand prove clearly that within the areas as a whole there has been a considerable re-distribution of the population, with considerable falls in the more central portions.

We now turn to complete our study of the city, of the county borough within its present limits. This involves the additions of 1918–30, of 1933 and of 1935. They fall into the parliamentary divisions of Thornbury, Frome and Weston-super-Mare in many bits and pieces of polling districts, the scrutiny and counting of which involved much care. It is unnecessary to repeat the earlier description of method and adjustments and we may proceed at once to the tabulations. They tell a very different story.

TABLE 11.   Estimated population aged 21 and over and registered electors, Added Areas of 1918–35

June	Estimated population aged 21 and over			Parliamentary electors* (residence qualifications only)		
	M	F	T	M	F	T
1931	3,085	3,283	6,368	2,832	3,085	5,917
1932	3,116	3,318	6,434	3,090	3,388	6,478
1933	3,135	3,349	6,484	3,371	3,727	7,098
1934	3,152	3,381	6,533	3,627	4,008	7,635
1935	3,169	3,413	6,582	4,523	4,926	9,449
1936	3,178	3,440	6,618	5,394	5,823	11,217
1937	3,187	3,461	6,648	6,157	6,597	12,754
1938	3,194	3,476	6,670	7,107	7,588	14,695

* 'Absent voters' all deemed men and included.

These basic figures show immediately the significant amount of (net) migration which must have taken place into these fringing areas. As follows:

TABLE 12. Annual changes in the estimated population aged 21 and over and in the parliamentary electors, Added Areas of 1918–35

June-June	Men		Women		Total	
	Population	Electors	Population	Electors	Population	Electors
1931–1932	31	258	35	303	66	561
1932–1933	19	281	31	339	50	620
1933–1934	17	256	32	281	49	537
1934–1935	17	896	32	918	49	1,814
1935–1936	9	871	27	897	36	1,768
1936–1937	9	763	21	774	30	1,537
1937–1938	7	950	15	991	22	1,941

TABLE 13. Estimated annual net migration of persons aged 21 and over, Added Areas of 1918–30

June-June	Men	Women	Total
1931–1932	227	268	495
1932–1933	262	308	570
1933–1934	239	249	488
1934–1935	879	886	1,765
1935–1936	862	870	1,732
1936–1937	754	753	1,507
1937–1938	943	976	1,919
Total	4,166	4,310	8,476

The fringes have had a (net) inward migration of between 8,000 and 9,000. This is the major conclusion of this part of our study.

We may now combine the final results and obtain figures for Bristol C.B., that is, the present city.

TABLE 14. Estimated population aged 21 and over and registered electors, Bristol C.B., 1931–38

June	Estimated population aged 21 and over			Parliamentary electors* (residence qualifications only)		
	M	F	T	M	F	T
1931	121,784	148,260	270,044	119,873	144,654	264,527
1932	123,105	149,795	272,900	121,460	146,436	267,896
1933	124,403	151,184	275,587	123,044	147,833	270,877
1934	125,754	152,711	278,465	124,285	148,997	273,282
1935	127,052	154,223	281,275	125,828	150,468	276,296
1936	128,187	155,521	283,708	127,078	151,511	278,589
1937	129,012	156,275	285,287	128,295	152,155	280,450
1938	129,720	157,009	286,729	128,920	152,457	281,377

* 'Absent voters' all deemed men and included.

TABLE 15. Annual changes in the estimated population aged 21 and over and in the parliamentary electors, Bristol C.B., 1931–38

June-June	Men		Women		Total	
	Population	Electors	Population	Electors	Population	Electors
1931–1932	1,321	1,587	1,535	1,782	2,856	3,369
1932–1933	1,298	1,584	1,389	1,397	2,687	2,981
1933–1934	1,351	1,241	1,527	1,164	2,878	2,405
1934–1935	1,298	1,543	1,512	1,471	2,810	3,014
1935–1936	1,135	1,250	1,298	1,043	2,433	2,293
1936–1937	825	1,217	754	644	1,579	1,861
1937–1938	708	625	734	302	1,442	927

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TABLE 16. Estimated annual net migration of persons aged 21 and over, Bristol C.B., 1931–38

June–June	Men	Women	Total
1931–1932	266	247	513
1932–1933	286	8	294
1933–1934	−110	−363	−473
1934–1935	245	−41	204
1935–1936	115	−255	−140
1936–1937	392	−110	282
1937–1938	−83	−432	−515
Total	1,111	−946	165

The city as a whole seems neither to have gained nor to have lost appreciably as a result of migration over the last seven years. The divergent movement between men and women would suggest, however, a fair amount of gain from male outsiders.

2. *The wider Fringe (Kingswood, Mangotsfield, Whitchurch, Bishopsworth and Filton), 1931–38*

Kingswood remained unchanged in its boundaries over the period. No adjustments have to be made to the basic census data. Deaths, however, are not counted by age and sex in the relevant detail for administrative areas other than metropolitan boroughs and county boroughs, and the various aggregated figures available (such as table 24 of the Registrar-General's Statistical Review, Part 1) are not suitable. Fortunately, we obtained from the Kingswood Medical Officer of Health reasonably adequate particulars for the years 1933–38. Over that period, deaths (21 and over, both sexes) averaged 134 a year. This figure was used as the base for the years 1931–32. As is obvious, it permits of no serious absolute error.

Mangotsfield was slightly altered in 1935 when an area with a total population of 142 in 1931 was added to it. An estimate of those aged 21 and over has been allowed for in obtaining the basic census data. The deaths were obtained by proportion from the Kingswood data.

The three parishes were more awkward to work with. Census data as to ages were available for the rural districts in which they were situated before the alterations in boundaries, and the relevant data were obtained by proportion from the adjusted figures. Again, any error is absolutely small. Nowhere is there reason to deny the general validity of the resulting figures and the order of magnitude must be correct. Deaths were derived proportionately from the Kingswood data and were small absolutely.

It will be noted that, as remarked earlier, the *ad hoc* addition of Patchway used in § I above is ignored here.

We now give the calculated figures.

There is a small opening want of harmony between the estimated male population and the registered electors in 1931, which substantially arises from Kingswood and Mangotsfield, where the element of estimating is small. No

TABLE 17.   Estimated population aged 21 and over and registered electors, Extra-Bristol C.B. Fringe, 1931–38

June	Estimated population aged 21 and over			Parliamentary electors* (residence qualifications only)		
	M	F	T	M	F	T
1931	9,568	10,634	20,202	9,645	10,362	20,007
1932	9,615	10,672	20,287	9,971	10,740	20,711
1933	9,700	10,762	20,462	10,216	10,944	21,160
1934	9,762	10,849	20,611	10,572	11,292	21,864
1935	9,861	10,929	20,790	11,232	12,002	23,234
1936	9,969	10,991	20,960	12,292	12,915	25,207
1937	10,057	11,082	21,139	13,415	13,983	27,398
1938	10,137	11,173	21,310	14,580	15,049	29,629

* 'Absent voters' all deemed men and included.

explanation has been found. There are also small differences in the parishes which fall within the error of the methods. But, as is obvious, the observed changes tell a plain story of considerable inward migration.

TABLE 18.   Annual Changes in the estimated population aged 21 and over and in the parliamentary electors, Extra-Bristol C.B. Fringe, 1931–38

June–June	Men		Women		Total	
	Population	Electors	Population	Electors	Population	Electors
1931–1932	47	326	38	378	85	704
1932–1933	85	245	90	204	175	449
1933–1934	62	356	87	348	149	704
1934–1935	99	660	80	710	179	1,370
1935–1936	108	1,060	62	913	170	1,973
1936–1937	88	1,123	91	1,068	179	2,191
1937–1938	80	1,165	91	1,066	171	2,231

And finally, the estimated migration:

TABLE 19.   Estimated annual net migration of persons aged 21 and over, Extra-Bristol C.B. Fringe, 1931–38

June–June	Men	Women	Total
1931–1932	279	340	619
1932–1933	160	114	274
1933–1934	294	261	555
1934–1935	561	630	1,191
1935–1936	952	851	1,803
1936–1937	1,035	977	2,012
1937–1938	1,085	975	2,060
Total	4,366	4,148	8,514

Thus, it would appear that this extra-Bristol fringe has gained by net migration between 8,000 and 9,000 adults in the last seven years.

3. *Statistical summary for the cluster*

These various figures may now be summed up into tables representing the area as a whole, except Patchway.

TABLE 20. Estimated population aged 21 and over and registered electors, Bristol Area (except Patchway), 1931–38

June	Estimated population aged 21 and over			Parliamentary electors* (residence qualification only)		
	M	F	T	M	F	T
1931	131,352	158,894	290,246	129,518	155,016	284,534
1932	132,720	160,467	293,187	131,431	157,176	288,607
1933	134,103	161,946	296,049	133,260	158,777	292,037
1934	135,516	163,560	299,076	134,857	160,289	295,146
1935	136,913	165,152	302,065	137,060	162,470	299,530
1936	138,156	166,512	304,668	139,370	164,426	303,796
1937	139,069	167,357	306,426	141,710	166,138	307,848
1938	139,857	168,182	308,039	143,500	167,506	311,006

* 'Absent voters' all deemed men and included.

TABLE 21. Annual changes in the estimated population aged 21 and over and in the parliamentary electors, Bristol Area (except Patchway), 1931–38

June–June	Men		Women		Total	
	Population	Electors	Population	Electors	Population	Electors
1931–1932	1,368	1,913	1,573	2,160	2,941	4,073
1932–1933	1,383	1,829	1,479	1,601	2,862	3,430
1933–1934	1,413	1,597	1,614	1,512	3,027	3,109
1934–1935	1,397	2,203	1,592	2,181	2,989	4,384
1935–1936	1,243	2,310	1,360	1,956	2,603	4,266
1936–1937	913	2,340	845	1,712	1,758	4,052
1937–1938	788	1,790	825	1,368	1,613	3,158

TABLE 22. Estimated annual net migration of persons aged 21 and over, Bristol Area (except Patchway) 1931–38

June–June	Men	Women	Total
1931–1932	545	587	1,132
1932–1933	446	122	568
1933–1934	184	−102	82
1934–1935	806	589	1,395
1935–1936	1,067	596	1,663
1936–1937	1,427	867	2,294
1937–1938	1,002	543	1,545
Total	5,477	3,202	8,679

4. *The significance of the results*

It remains to discuss the significance of our results. Obviously, the method has its limitations and only broad conclusions can be derived from it.

As to Bristol C.B. it seems reasonably established that the county borough has neither gained nor lost much by adult migration. A consistent (net) outward stream from the more inner parts of the city to the more outer parts also seems established. This is quite consistent with other evidence, in

particular, slum clearances and housing estates, which also go to prove a decanting of the population from the relatively central areas to the suburbs and fringes.

But the figures necessarily are *net*, they give merely the balance between the outward and the inward streams of migration. It is desirable in general to be able to say something of the magnitude of each stream, but this is impossible. The detailed figures, however, suggest that figures for women are particularly useful in indicating something of this. The historical figures of § I, based on census and vital statistics, show the relative de-populations of the inner zones. The figures for women electors in Bristol P.B. for 1931–38 show a consistent and unbroken trend in the same direction. The increase from year to year first diminishes, then becomes negative and the negative figure begins to grow (see Table 8), showing a steady falling-off in women electors. There is not the same marked consistency for men electors. It seems reasonable to explain this by saying that the two streams, the inward and outward migration, are less mingled in the case of women than of men. The movement in the figures for women may indicate more clearly and with less intermingling the outward stream of families and households to the outskirts. They may be moving outward with their husbands and families, and this argument would include the single women living in families. The more confused figures for men would then represent the intermingling of the outward and inward migration movements through the inward movement of younger unmarried male immigrants conflicting with the outward movement of families. Single women migrate less than single men and the streams for women are less intermingled than the streams for men in respect to any well-established centre of settlement. This explanation seems prima facie true of the parliamentary borough. But it does not, and need not, apply equally to the movement round the suburbs. There the housing and other conditions do not permit so ready an absorption of (say) lodgers and unmarried immigrants as do those of the older parts. The immediate outskirts of the parliamentary borough, the periphery of the county borough, are more necessarily composed of households. If the detailed figures for the added areas of 1918–35 are studied, it will be seen that the fluctuations year by year in the figures for men voters are almost exactly matched by the fluctuations in the figures for women voters, sign for sign. It would seem that, for areas such as the Bristol parliamentary borough, the changes in the electoral roll for women would give a sharper and truer picture of household migration than the changes for men.

The wider fringe of Kingswood, Mangotsfield, Filton, Whitchurch and Bishopsworth has been gaining considerably—some 8,000 to 9,000 adults, with men slightly in the majority. Kingswood, from an electoral base in 1931 of some 9,000, has gained (say) 1,600; Mangotsfield, from its 1931 base of some 7,500, has gained (say) 2,500; Filton, from its 1931 base of 2,000, has gained (say) 3,700, an obvious result of the aircraft developments there; Whitchurch and Bishopsworth, from their combined base of 1,000, have gained some 600–700. The general influence of the rearmament programme, with its local centre at the Filton aircraft works, is obvious. The wider fringe of Bristol is developing, in the present decade, not from the wider outflowing

of Bristolians in accordance with the hitherto normal historical spreading of
cities but from the repercussions of the international situation. In these parts,
an electoral roll of some 20,000 in 1931 has swollen to almost 30,000 by 1938—
an increase of well-nigh some 50 per cent in what was substantially rural and
semi-rural surroundings and circumstances. The consequent problems in local
government and in housing are obvious.

For whatever area chosen, whether Bristol P.B. or its fringes or Bristol C.B.
or the separate parts of the wider fringe, the figures show a distinct 'kick'
from about the middle of 1934. Taking the area as a whole, the three years
1931–34 show a net inward movement of 1,782—say about 600 a year on the
average. The remaining four years, 1934–38, show a net inward movement
of 6,897—say, 1,700 a year. It seems inevitable to connect the date and the
acceleration with the other date—the 1935 announcement of expanding
rearmament.

In one respect, however, the figures may be further discussed. Out of the
net balance gained by inward migration, the men number some 5,000—6,000,
say 5,500. The net balance of men gained after mid-1934 would amount to
some 4,500. (The net balance of women after mid-1934 would amount to
some 2,600, but the problem is not connected substantially with them.) It
will be shown below in § III that at the Ministry of Labour count of un-
employment insurance cards in July 1938, a Bristol area approximately the
same as the area considered in this section contained some 13,691 'migrant'
men, in the sense that they obtained their first insurable employment outside
the Bristol area. Of these, 1,441 were from certain fringing exchanges; they
were probably domiciled in their own fringes and would not be 'migrants'
as defined and worked out in the present section. Even so, some 12,000
migrants are left, and while some further deductions might be made from
§ III migrants coming from Gloucester and Somerset, the Ministry of Labour
source indicates a stock of migrants of about 12,000. It is further suggested
in § III that the bulk of these migrants are probably post-1935 in their
movement.

This last suggestion seems in the main substantiated by the decided 'kick'
in all the figures after mid-1934.

The general differences between the results of the present section and of
§ III look great, but this to a considerable extent is illusory.

The figures in § III, namely 12,000 men, relate to men under the un-
employment insurance acts aged 21–64 who have migrated into the area any
time between 1920 and 1938. They represent the gross inward stream of
migration. The present figures of some 5,000—6,000 represent the net balance
of the inward and outward streams of adult males into the area since 1931.
The universe of the statistics differs in working definition of migrancy and
area, in being gross and net, in period, and in subjects (insured male population
and general male population).

Yet, rough though their comparability is, it may throw some light on the
outward movement from the area. It will be seen from Table 5 (b) in § I,
that the cluster there defined had in the decade 1921–31 a net inward migration
of the general population of some 2,400 on (approximately) the resident

population basis or some 4,800 on (approximately) the enumerated population basis. If we take a third or a quarter as a reasonable fraction to represent men 21 and over, we would have a (net) inward migration of men of some 600–800 on one basis and 1,200–1,600 on the other. Either of these approximations is very small. To our present figures of 5,000–6,000 representing adult male migration in the present decade we may add, say, 1,000 from the last—giving a net inward movement of adult males of about 7,000. With a recorded 12,000 migrants in the area and a net movement roughly of the order of 7,000, we are left with an outward flow roughly of the order of 5,000.

§ III.   INFLUX OF INSURED LABOUR, 1920–38[1]

For this section, 'Bristol' is defined as the area served by Ministry of Labour exchanges and offices of Bristol, Bristol Docks, Avonmouth, Eastville, Kingswood and Westbury-on-Trym. This area is substantially the same as that of the cluster.

As is well known the best single source of information on the internal migration of labour is the annual count or census of the Ministry of Labour taken each July at the exchange of unemployment insurance books. On entering insurable employment every person is given an insurance book or card bearing the name of the local office or origin. This name remains unchanged throughout the person's insurance history and is transferred from book to book at the annual exchanges. If, therefore, in any given area a count is made of the books exchanged there but issued otherwise than in that area, the insured holders must have started insurable employment outside it. In official language such books are 'foreign books' and, economically speaking, their holders are 'migrants' to the given area. Consequently a migrant is here defined as a holder of a foreign book, that is, one issued other than in Bristol as defined above.

But certain administrative points must be borne in mind and allowed for before we can make a sure transition between 'foreign books' and 'migrants'. First, books issued to members of H.M. forces on discharge, etc. are issued centrally under the conventional title of Kew, Nore, Tower or Peak—Kew being an older title and the others standing for Navy, Army and Air Force respectively. The home address or other true origin of these insured workers is not known and it is impossible to say whether they are migrants or not. Secondly, the Ministry of Health inspectors acting on behalf of the Ministry of Labour issue books where employers are found contravening the law, etc., and these books bear a conventional title representing Ministry of Health divisions.[2] For the present study, the title 'Clifton' represents the South-West division of the Ministry of Health and it is impossible to split the recorded books into Bristol and non-Bristol. Other titles, however, could be assigned geographically without serious error. Thirdly, an insurance book can be exchanged where the holder pleases. In particular, employers may exchange

1 I am very indebted to Miss Ruth Thompson for much help in the detailed work of this part.
2 These divisions are not co-terminous with the divisions of the Ministry of Labour.

all the books of their employees (including those from branches) at the exchange most convenient for them, e.g. where their own head office is situated. This practice of wholesale exchange, called 'bulk exchange', can add greatly to the difficulty of interpreting the official returns for purposes of economic analysis in some cases. For the local insured population is merely the sum of the locally exchanged books and not merely the people working there. Where the books exchanged contain books from non-Bristol branches they will be referred to as 'foreign bulk exchange'. In migration studies 'foreign books' from outside branch-offices which are exchanged 'in bulk' do not denote 'migrants' and must be deducted. They are not serious in Bristol and the local exchange managers have the necessary data relating to them; and consequently the correction has been made here.[1] The other side of the shield—the possibility that an insured person may exchange his book in (say) his home area though working elsewhere—must not be forgotten, but it is impossible to allow for this and it is likely to be insignificant. Fourthly, where an area contains a Government Training Centre this is likely to have drafted to it a number of outside insured persons who can hardly be called migrants. Again, the appropriate correction has been made here.

When allowance is made for these points, where possible, the resulting figures are our best measure of the influx of labour so far as insured workers are concerned. It is clear they will represent an under-estimate, especially from the first two heads.

At the July exchange of books 1938, the following particulars were abstracted for each 'foreign book': Local Office, Serial Number, Type of Book, Industry Letters and Employment. From the particulars of local offices, the geographical origin of the migrants was determined and summarized from county details into Ministry of Labour divisions, with some subdivisions of local importance. The type of book and the industry letters permit an industrial classification by sex and broad age groups, the industrial classification following the major industries of the Ministry but again with subdivisions for the detailed industries of the Ministry which happen to be of local migrational importance. The question on employment had, naturally, to be worded to suit the administrative process in the exchange of books, and a migrant is here deemed 'employed' if his book was stamped in the last week of the old insurance year and deemed 'unemployed' if his book had no such stamp.

I

The total number of insured workers in Bristol in July 1938 is officially given as 164,390. This total contains 3,341 'foreign books' exchanged in bulk from non-Bristol branches of the employers and the adjusted total is therefore 161,049. Further, 4,501 books were exchanged relating to ex-members of H.M. forces and 572 books were Ministry of Health issues for 'Clifton'; it is impossible to say how many of these 5,073 books denote migrants. The local Government Training Centre contributed 360 'foreign books', but these are

[1] I understand that sometimes railway workers recruited locally report at first to (e.g.) Derby and are taken on there with a subsequent (perhaps, immediate) drafting back. It follows that the entries for the Railway Service are slightly dubious.

not deemed to denote migrants as here understood. We are left with a total of 17,061 'foreign books' which denote known migrants within the definition. There is, naturally, some evidence (not printed) that the ex-forces books contain migrants; this is clear from their percentage distribution of industries, but the number is unknown. At a minimum, 10·6 per cent of all of Bristol's insured workers were migrants.

When did they come to Bristol? No very definite answer is possible. Strictly, they·can have come any time between 1920 and 1938, for the employment insurance acts have generally been in operation over that period. But we can limit the range and obtain the most probable time.

Bristol C.B., Kingswood U.D. and Mangotsfield U.D. cover approximately the same area as the exchange areas here called Bristol. The census data show that they lost 2,384 through net migration in the decade 1921–31. This refers to the resident general population and is the balance of the migrational outflow and inflow. Whilst it is obviously dangerous to apply the census data to the present problem—the probable date of influx of insured labour—there seems a reasonably prima facie case for suspecting that the bulk of our 17,000 holders of 'foreign books' did not arrive in Bristol during the decade 1921–31 and for suspecting that the bulk migration implied would be post-1931. To support this there is some more positive evidence. It is well known that the special boom in the Bristol area is due to the development of the aircraft industry under expanding armaments, and this is post-1935. As by far the greater part of the influx of insured labour is men 21–64 the following table is immediately relevant. Inclusive of foreign bulk exchange it gives the recent changes, with particulars of those industries where migration inwards has been of importance in varying degree.

TABLE 23.   Bristol Area: Estimated number of insured men, 21–64

Industry	July							
	1931	1932	1933	1934	1935	1936	1937	1938
Aircraft*	4,065	3,840	4,375	4,350	5,090	8,070	10,880	14,068
Building and Contracting	11,980	12,295	12,355	13,140	13,060	14,660	14,910	15,219
Distributive	11,110	11,695	12,240	11,820	11,250	12,010	12,190	12,356
Transport	12,615	12,513	12,403	12,590	11,350	12,190	11,585	11,755
Engineering and Metals	7,127	7,082	6,823	6,483	6,804	7,594	7,889	7,348
Food, Drink and Tobacco	7,150	6,850	6,805	7,045	7,010	7,391	7,105	7,019
Others	26,337	26,570	26,310	27,128	26,211	27,335	28,561	29,510
Total	80,384	80,845	81,311	82,556	80,775	89,250	93,120	97,275

*Aircraft = motor vehicles, cycles and aircraft.

The insured men 21–64 will increase through new entrants to that age group and be reduced by deaths, by men attaining age 65, etc., and they will be increased by net immigration. The inflow at age 21 during 1935–38 will be affected by the diminishing births of 1914–17 and the outflow at age 65 by the increasing withdrawals of the survivors of the rising births of 1870–73. Deaths may be deemed fairly constant. The rate of increase in the age group

should be slowing down in 1935–38 as a result of these factors of vital statistics. We may, therefore, take it as fairly certain that the observed growth is primarily due to net immigration into Bristol and that, despite the possible complications of the unknown outward emigration, the bulk of the influx is mainly post-1935 and is a matter of the last few years. As is obvious, the rise of the aircraft industry is the main cause. Indeed this expansion is changing fundamentally the economic balance of Bristol, and whilst it shows a satisfactory adaptability of the area to changing conditions, it also introduces an element of precariousness to some degree.

What has been the nature of this inflow? This is best answered by the sex-age distribution, to which the general Bristol figures (exclusive of foreign bulk exchange) are added.

TABLE 24.   General and migrant sex-age distribution

	Insured males				Insured females				
	14–15	16–20	21–64	All	14–15	16–20	21–64	All	Total
Bristol	5,179	16,847	94,657	116,683	4,752	14,574	25,040	44,366	161,049
Migrants	199	1,066	13,691	14,956	162	528	1,415	2,105	17,061
Bristol	4·4	14·4	81·1	100	10·7	32·8	56·4	100	.
Migrants	1·3	7·1	91·5	100	7·7	25·1	67·2	100	.
Bristol	100	100	100	100	100	100	100	100	100
Migrants	3·8	6·3	14·5	12·8	3·4	3·6	5·7	4·7	10·6

It can be computed that in Bristol as a whole insured males form 72·5 per cent and insured females 27·5 per cent; but of the migrants, 87·7 per cent are male and 12·3 per cent female. Again, it can be seen that of Bristol's insured males, the men 21–64 form 81·1 per cent but of the migrant males, the men 21–64 form 91·5 per cent; and of Bristol's insured females, the women 21–64 form 56·4 per cent but of the migrant females, the women 21–64 form 67·2 per cent. And so on. Or, aggregating males and females, we find that of Bristol's insured population 74·3 per cent are in the age group 21–64 but of the insured migrants 88·5 per cent are in that age group.

The inflow of younger people has, of course, been greater than the figures show, because children accompanying their parents to Bristol and subsequently obtaining insurable employment would obtain a Bristol book and be lost to migrational studies along these lines. But as the date of the influx is most likely to be post-1935, no serious under-estimate is likely to be present in the above figures. Equally, the influx of women is likely to be under-estimated in so far as they enter the non-insurable occupation of domestic service in private houses. The predominance of adult males in the influx is natural, but one regrets that any split-up of ages after 21 is not possible.

To what industries have the migrants come? An immediate summary is: over half the adult males are in the three industries of Aircraft, Building and the Distributive trades. Although a rapidly growing industry must largely grow by migration in these days of small natural increase and although

industrial development must tend to be asymmetrical, this concentration is disappointing when the diversified nature of Bristol trades is remembered.

From the point of view of national re-adjustment, the geographical origins are also somewhat disappointing. The question, Where have the migrants come from? is answered quite simply. Over a quarter have come from Glamorgan and Monmouth and another quarter from Gloucester, Somerset and Wiltshire. The pressure on the Welsh distressed areas has been slightly eased, but there has been little movement from other special areas farther afield. Even in these days both of depressed areas and of good transport Ravenstein's thesis of the 1880's, that migration is predominantly a short-distance movement, would still hold good in the present study. Indeed, when certain 'fringing areas' are remembered, the above summary itself may be too flattering to the forces of national adjustment.

What has been the fate of the migrants and how have they fared? An indication can be had from the employment question. The following table briefly sums up the answer. It gives the percentages of unemployment for the Bristol area, exclusive of foreign bulk exchange, for the 18th July 1938 and for the migrants as in the week ended 3rd July 1938.

TABLE 25.   Unemployment comparison, percentages

	Insured males				Insured females				All
	14–15	16–20	21–64	All	14–15	16–20	21–64	All	
Bristol	1 0	3·7	10·2	8 9	1·0	2·8	5 8	4·3	.
Migrants	4·0	8·7	11·7	11·4	9·9	11·6	16·5	14 7	11·8

These differences are true differences; there is nothing in the local circumstances to explain them away merely by the slight difference in dates or other conditions. They must be regarded as significant. Indeed, they under-rate the position. The special position of aircraft must be allowed for. Unemployment there is very small (1·4 per cent in all) and migration there is very important. We can confine the adjustment to men 21–64, for with them it is most relevant. The insured men 21–64 in Bristol other than in aircraft numbered 80,649 net and 9,470 were unemployed on the 18th—their unemployment percentage exclusive of aircraft was 11·7. The corresponding figures for migrants are 9,477 and 1,516—their unemployment percentage exclusive of aircraft was 16·0 for the week ended the 3rd. However better off migrants to Bristol may be compared with what they might have been at home, they are not so well off as the native Bristolians. Whether this arises from the principle that charity begins at home or from some unsuitability in the migrants is at present unknown. A significant difference in fate does exist, and it is against the migrant.

2

The results may now be viewed in somewhat greater detail. We can first ask two questions: How important are the different industries to the migrants? and How important are the migrants to the different industries?

The following table gives the answers for men, 21–64:

TABLE 26.   Industrial distribution, Men 21–64

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Aircraft, etc.	14,008	4,214	14·8	30 8	30 1
Building	11,796	1,884	12 5	13 8	16 0
Distributive	11,805	1,654	12 5	12 1	14 0
Public Works	2,802	480	3 0	3 5	17 1
Printing and Paper	5,680	471	6 0	3 4	8 3
Shipping and Docks	4,448	465	4 7	3 4	10·5
Food, Drink and Tobacco	6,967	461	7 4	3·4	6 6
Trams, Buses and Road Transport	5,005	384	5 3	2 8	7 7
Brass, Zinc, etc Manufacture	1,594	370	1·7	2 7	23·2
Gas, Water and Electricity	2,412	340	2 5	2 5	14·1
General Engineering	2,976	310	3 1	2 3	10 4
Others	25,164	2,658	26·6	19 4	10·6
Totals	94,657	13,691	100·0	100 0	14 5

From this we see that the aircraft industry accounted for 14·8 per cent of all insured men (21–64) in the Bristol area in 1938 and that it accounted for 30·8 per cent of such migrants. It is now the leading Bristol industry. Five years ago it accounted for about 5·4 per cent. Of its adult male labour, 30·1 per cent is migrant and 69·9 per cent is local in origin. Equivalently, the building industry attracted 12·5 per cent of insured men but 13·8 per cent of such migrants; and its composition is 16 per cent migrant and 84 per cent local. The distributive trades, with 12·5 per cent of all men, had 12·1 per cent of the migrants; they are composed as 'to 14 per cent from migrants and 86 per cent from local sources. These three industries accounted for 39·8 per cent of insured men but accounted for 56·7 per cent of the migrant men; and their composition is 20·6 per cent migrant and 79·4 per cent local. And so on. In all, 14·5 per cent of insured men 21–64 were migrant—a high absorption rate.

When we move to the younger insured men (16–20), the pattern is somewhat different. As follows:

TABLE 27.   Industrial distribution, Men 16–20

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Aircraft, etc.	3,057	401	18·2	37·6	13·1
Building	1,196	97	7 1	9·1	8·1
Distributive	3,141	159	18 6	14·9	5·1
Public Works	76	10	0·4	0·9	13·2
Printing and Paper	1,133	23	6·7	2·2	2·0
Shipping and Docks	322	23	1·9	2·2	7·1
Food, Drink and Tobacco	1,091	43	6·5	4·0	3·9
Trams, Buses and Road Transport	400	13	2·4	1·2	3·3
Brass, Zinc, etc. Manufacture	143	9	0·8	0·8	6·3
Gas, Water and Electricity	377	28	2·2	2·6	7·4
General Engineering	873	38	5·2	3·6	4·4
Others	5,038	222	29·9	20·8	4·4
Totals	16,847	1,066	100·0	100·0	6 3

The absorption rate is only 6·3 per cent, much less than half the rate for the older men. Except in the expanding aircraft works the Bristol cluster virtually

is self-sufficient in younger male labour. But that expanding industry, with 18·2 per cent of such labour in all, had drawn to itself 37·6 per cent of the younger migrants. The aircraft industry and the distributive trades accounted for 52·5 per cent of the younger male migrants.

When the two tables above are aggregated to give insured males 16–64, the following is the result:

TABLE 28.   Industrial distribution, Men 16–64

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Aircraft, etc.	17,065	4,615	15 3	31 3	27 0
Building	12,992	1,981	11·7	13 4	15 2
Distributive	14,946	1,813	13·4	12 3	12 1
Public Works	2,878	490	2·6	3 3	17 0
Printing and Paper	6,813	494	6 1	3 3	7·3
Shipping and Docks	4,770	488	4·3	3 3	10 2
Food, Drink and Tobacco	8,058	504	7·2	3 4	6·3
Trams, Buses and Road Transport	5,405	397	4 8	2·7	7·3
Brass, Zinc, etc. Manufacture	1,737	379	1 6	2·6	21 8
Gas, Water and Electricity	2,789	368	2 5	2 5	13·2
General Engineering	3,849	348	3·5	2·4	9 0
Others	30,202	2,880	27·1	19·5	9 5
Totals	111,504	14,757	100·0	100·0	13 2

The inclusion of the younger insured men slightly changes the detail but leaves the main impression the same, except that now the percentage of migrants in the Bristol area is reduced to 13·2 and the percentage of local labour raised to 86·8—but the rate of absorption is still high.

It is important, however, to note at once that of the above 14,757 'migrants', 1,647 come from *adjoining* areas which form a fringe round the Bristol cluster.

It is disturbing to find that Bristol's attractive and absorbing power is so largely to be explained by a single industry and that a precarious one. The rise of the aircraft industry is the most striking feature of Bristol's industrial development in recent years—indeed, it may be said to be that development. Although it has told in reducing unemployment it has not told as much as might be expected in causing a more general and diversified expansion throughout the range of Bristol's localized industries. This lack of generalized secondary expansion, save perhaps in the building trade, no doubt explains the low rate of absorption in Bristol's older industries. The rate of absorption in general is highly satisfactory (14·5 per cent for men 21–64 and 13·2 per cent for men 16–64), but its split-up into industries should shake too complacent an enjoyment of a general average, a complacency to be further reduced when unemployment among migrants comes to be studied. Some doubt still remains as to the real resilience possessed by our economy. The special but small case of Brass and Zinc is explained by the setting up of a smelting works at Avonmouth and the high percentage in Gas and Water is partly explained by the fact that the local water supply is a company supply, which company may move its men about from the catchment area and works to the Bristol area here defined.

Our questions, How important are the different industries to the migrants? and How important are the migrants to the different industries? may now be

answered for women. Naturally, the pattern is different from that for men. As follows:

TABLE 29.   Industrial distribution, Women 21–64

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Distributive	5,656	539	22 6	38 1	9 5
Hotel, etc.	1,725	252	6·9	17 8	14 6
Food, Drink and Tobacco	4,893	126	19·5	8 9	2·6
Prof. Services	1,080	88	4·3	6 2	8·1
Clothing and Boots	3,376	60	13 5	4 2	1 8
Laundries, etc.	993	55	4 0	3 9	5·5
Aircraft, etc.	412	41	1·6	2 9	10 0
Entertainment	327	33	1 3	2·3	10 1
Printing and Paper	3,021	33	12 1	2 3	1·1
Local Government	462	28	1·8	2 0	6·1
Others	3,095	160	12·4	11·3	5 2
Totals	25,040	1,415	100·0	100·0	5·7

The main lessons are clearer. Whereas 14·5 per cent of men 21–64 were migrant, only 5·7 per cent of the women were migrant. Women appear to move about less than men. But the rather undue concentration of migrants is again seen—over half the women migrants are found in the two groups of the distributive trades and hotels, clubs, etc. It will be remembered that the acts do not cover private domestic service and consequently the present Ministry of Labour sources give an incomplete account of female migration. Equally, too, we have no measure of the transfer to the 'not gainfully employed' occupation of matrimony.   • •

For the younger women (16–20) the summary is:

TABLE 30.   Industrial distribution, Women 16–20

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Distributive	2,975	222	20·4	42·0	7·5
Hotels, etc.	465	51	3·2	9 7	11·0
Food, Drink and Tobacco	3,015	69	20·7	13 1	2·3
Prof. Services	300	12	2·1	2·3	4 0
Clothing and Boots	1,419	19	9 7	3·6	1·3
Laundries, etc.	697	31	4 8	5 9	4·4
Aircraft, etc.	282	22	1·9	4·2	7·8
Entertainment	144	8	1 0	1·5	5·6
Printing and Paper	2,832	23	19·4	4·4	0·8
Local Government	173	6	1·2	1·1	3·5
Others	2,272	65	15·6	12 3	2·9
Totals	14,574	528	100·0	100·0	3·6

The small proportion, the low absorption rate, is noteworthy—only 3·6 per cent of women 16–20 are migrant. The concentration into the distributive trades and, for this age group, into the food industries, is obvious—they accounted for over half the younger women migrants.

Insured women 16–20 amount to a much higher proportion (58·2 per cent) of insured women 21–64 than younger men do of older men (= 18·1 per cent). This fact shows in the pattern given by the aggregate table, as follows:

TABLE 31.   Industrial distribution, Women 16–64

Industry	All	Migrant	All %	Migrant %	Migrant proportion %
Distributive	8,631	761	21 8	39·2	8·8
Hotels, etc.	2,190	303	5·5	15 6	13·8
Food, Drink and Tobacco	7,908	195	20 0	10 0	2 5
Prof. Services	1,380	100	3 5	5 1	7 2
Clothing and Boots	4,795	79	12 1	4 1	1·6
Laundries, etc.	1,690	86	4·3	4 4	5·1
Aircraft, etc.	694	63	1·8	3 2	9·1
Entertainment	471	41	1 2	2·1	8 7
Printing and Paper	5,853	56	14·8	2·9	1·0
Local Government	635	34	1 6	1 7	5·4
Others	5,367	225	13 5	11·6	4 2
Totals	39,614	1,943	100·0	100·0	4·9

The three industries of Distributive, Hotels and Clubs, etc., and Food, etc. accounted for almost two-thirds of the migrant women as against less than half of all women.

As to the boys and girls (14–15), their numbers are small—361 in all. Of the boys (=199), a third are in aircraft, a seventh in the distributive trades and an eighth in building—60·9 per cent in all. Of the girls (=162), about a quarter are in the Food, Drink and Tobacco group and about a fifth in the Distributive trades—42·5 per cent in all.

3

The major question, Where have the migrants come from? meets immediately with a difficulty in finer definition. Inevitably the holder of a 'foreign book' must have originated in insurable employment outside the area of enumeration. But how far outside must that have been if he is to qualify as a migrant to the area? Bristol is here defined as the six local exchanges which cover the Bristol urban cluster. What of the man who started work just outside the boundary and is now working, or exchanging his book, within it?

The employment exchanges which fringe the cluster are the exchanges of Clevedon, Portishead, Chew Magna, Keynsham, Winterbourne, Chipping Sodbury and Thornbury. With these local transport is fair to good and it is questionable whether a person from those parts, though country, who moved to Bristol or worked there without actual removal to live there, would regard himself as a migrant. For any area of study, however, a line must be drawn somewhere and such persons are regarded as migrants. But to bring out the problem the above seven exchanges are collectively separated and called the fringe. Insured workers from other areas are undoubtedly migrant.

From the detailed tables (not given here), the following summary can be built up to give the geographical origins, omitting boys and girls (Table 32). The ties of home and obstacles of distance are clearly reflected in this table.

Of the younger men (16–20), the fringing area contributed 19·3 per cent and the rest of Gloucester, Somerset and Wiltshire contributed 19·7 per cent. Glamorgan and Monmouth—at once near and depressed—contributed almost a quarter (22·3 per cent). For younger women, distance is an even more formidable obstacle. The fringe accounted for a fifth and the surrounding

TABLE 32. Geographical distribution

Origin (M.L. division)	Insured men			Insured women			Insured persons		
	16–20	21–64	16–64	16–20	21–64	16–64	16–20	21–64	16–64
Fringe	19·3	10·5	11·2	20·3	9·5	12·5	19 6	10·4	11·3
Rest, Gloucester, Somerset and Wilts.	19·7	18·8	18·9	29 9	24·3	25·8	23·1	19·4	19·7
Rest, South-Western	8·3	7·0	7·1	12·5	13·6	13·3	9·7	7·7	7·9
Glamorgan	15·7	20·8	20·4	7·0	6·6	6·7	12·8	19·5	18·8
Monmouth	6·6	7·3	7·3	5 1	3·7	4·1	6·1	7·0	6·9
Rest, Wales	3·3	2·2	2·2	1·1	0·9	1 0	2·6	2·0	2·1
Staffs., Warwick and Worcester	3·6	4·8	4·7	5·3	5·4	5·4	4·1	4·8	4·8
Rest, Midlands	1·8	2·6	2·5	1·9	3·4	3·0	1 8	2·7	2·6
South-Eastern	4·5	4·1	4·2	4·2	6·1	5·6	4·4	4·3	4·3
London	6·3	6·7	6·6	4·5	12·9	10·6	5·7	7·2	7·1
North-Western	4·5	6·3	6·2	3·4	5·5	4·9	4·1	6·3	6·2
Northern	2·0	2·3	2·3	1·7	1·3	1·4	1·9	2·2	2·2
North-Eastern	2·2	2·8	2·8	1·7	3·3	2·9	2·0	2·9	2·8
Scotland	1·3	2·8	2·7	0·9	2·7	2·2	1·2	2·8	2·6
Northern Ireland	1·1	0·8	0·8	0·4	0·8	0·7	0·9	0·8	0·8
Total	100	100	100	100	100	100	100	100	100

counties three-tenths, and the South-Western division in all for almost two-thirds (62·7 per cent). Very much the same can be said of the older workers. Of the men 21–64, the fringe and the surrounding counties contributed over a quarter (29·3 per cent). Again, Glamorgan and Monmouth, near and depressed, contributed heavily with over a quarter between them (28·1 per cent). Of the women 21–64, the fringe and the surrounding counties contributed a third (33·8 per cent), and the rest of the division brought this up to almost a half. And so on. The immobility of the northern areas, despite their depression, is still striking.

It is instructive to combine the industrial and geographical distributions. The following brief table brings out some of the major points as regards adult men:

TABLE 33. Origins and industries, Migrant Men 21–64

Origins	Number	Percentage in each industry						
		Aircraft, etc.	Building and Public Works	Distributive	Transport (all)	Commerce Nat. Govt. Loc. Govt. Profs. and Entertain.	Others	Total
Fringe	1,441	18·9	26·4	7·2	9·7	5·1	32·7	100
Rest, Gloucester, Somerset and Wilts.	2,580	26·8	15·4	20·8	7·2	5·0	24·8	100
Rest, South-Western	967	23·6	12·2	22·0	8·6	5·9	·27·7	100
Glamorgan	2,848	31·3	22·5	8·7	6·1	4·3	27·1	100
Monmouth	1,005	29·5	25·0	7·0	5·9	3·9	28·7	100
Rest, Wales	296	40·5	13·9	12·2	6·4	3·0	24·0	100
Staffs., Warwick and Worcester	656	45·9	9·3	8·7	4·4	4·0	27·7	100
Rest, Midlands	353	24·1	13·0	9·9	13·6	7·1	32·3	100
South-Eastern	567	29·1	13·6	13·6	7·6	4·9	31·2	100
London	911	23·9	11·3	15·4	8·6	7·9	32·9	· 100
North-Western	864	46·2	9·6	6·4	8·0	3·5	26·3	100
Northern	320	41·6	17·8	6·9	9·1	4·1	20·5	100
North-Eastern	388	39·4	15·7	8·5	5·2	4·6	26·6	100
Scotland	383	51·4	8·4	5·2	9·4	3·9	21·7	100
Northern Ireland	112	56·3	12·5	5·4	10·7	4·7	10·4	100
Totals	13,691	30·8	17·3	12·1	7·5	4·8	27·5	100

This table has some difficulties in interpretation. Taking Aircraft and Building (with contracting) together as representing the most important intake of *industrial* labour in the narrower sense, especially if some skill is postulated, they suggest that skilled labour comes from far and unskilled from near districts, though their suggestion is not conclusive. It is clear that what the *Economist* has called 'Outer Britain' has on the whole shown a tendency to migrate to the aircraft industry, perhaps to the more skilled posts. Consider, for example, the distinctly higher percentage there from the Black Country (itself prosperous with expanding rearmament), and the northern divisions as a whole. Wales as a whole has contributed less than might have been expected to Aircraft. Its most important sections, Glamorgan and Monmouth, have shown an unusually big drift into building and public works contracting— traditional homes for lost men. Out of the 3,853 men from the two counties, 23·1 per cent are there—17·4 per cent in building and 5·7 per cent in contracting, percentages which contrast unfavourably with those for migrant men as a whole (0·215 per cent and 3·0 per cent). The divisions of 'Inner Britain', except the Staffordshire and surrounding area, are merely average in their propensity to aircraft activity, with a side bias to the distributive trades—a bias very marked for nearer counties. The high percentage from the Midlands in transport may, as already indicated, be partly the result of the mode of railway recruitment and cannot be pressed. But the main suspicion, that skilled labour may be long-distance in movement and unskilled labour short-distance, needs further investigation, though it seems prima facie reasonable.

4

A closer analysis of the fate of the migrants in their new home is needed. How have they fared in employment, as tested simply by the presence or absence of a stamp early in July 1938? The general conclusion has already been indicated. How does it stand in the details?

For insured men, 21–64, Table 34 sums up Bristol's general unemployment history in recent years. It is to be read with Table 23 above. The figures are the simple average of the May and November unemployment counts in each year and are expressed as percentages of the July insured population inclusive of foreign bulk exchange.

Against this background, what has been the fate of migrants? How have they fared in unemployment? Directly comparable figures are not possible. We know the total insured population and the total insured migrants, so that subtraction gives us insured Bristolians (i.e. those who originated in insurable employment within the cluster of the six exchanges), and these are comparable. But we know total unemployment for the 18th July and migrant unemployment for the week ended 3rd July and we must subtract the one from the other and, ignoring the small difference in dating, regard the difference as representing the unemployment of Bristolians. No serious error is at all likely to ensue. All figures are exclusive of foreign bulk exchange. For men 21–64 the results are given in Table 35.

TABLE 34.   Bristol Area, Unemployment, Men 21–64

Industry	1931	1932	1933	1934	1935	1936	1937	1938
			Average of May and November each year					
Aircraft, etc.	826	992	694	381	201	185	173	228
Building, etc.	2,979	4,406	4,397	3,962	3,597	2,994	2,688	2,787
Distributive	1,633	1,797	2,064	2,032	1,907	1,652	1,275	1,245
Transport	3,097	3,491	2,443	2,781	2,148	1,516	1,348	1,059
Engineering, etc.	1,988	2,281	1,821	1,198	897	658	546	542
Food, etc.	710	854	772	804	727	699	546	538
Other	6,145	7,424	6,807	6,133	5,264	4,483	3,931	3,500
Totals	17,378	21,245	18,998	17,291	14,741	12,187	10,507	9,899
			Percentages of above on July each year (Table 23)					
Aircraft, etc.	20·3	25·8	15·9	8·8	3·9	2·3	1·6	1 6
Building, etc.	24·9	35·8	35·6	30·2	27·5	20·4	18·0	18·3
Distributive	14 7	15·4	16·9	17·2	17·0	13·8	10·5	10·1
Transport	24·6	27 9	19·7	22·1	18 9	12·4	11·6	9 0
Engineering, etc.	27·9	32 2	26·7	18·5	13·2	8·7	6·9	7 4
Food, etc.	9·9	12·5	11·3	11·4	10·4	9 5	7·7	7·7
Others	23·3	27·9	25·9	22·6	20·1	16·4	13·8	11 9
Totals	21·6	26 3	23·4	20·9	18·2	13·7	11·3	10·2

To this we may add women 21–64 and all persons 21–64, as follows:

Women, 21–64	17·3	11·2	9·9	9·2	7·7	6·3	6·2	6·2
All persons, 21–64	20 6	22·7	20·3	18·3	15·8	12·1	10·2	9·4

If we exclude Aircraft the figures for 1938 move up to 11·6 per cent for men 21–64, 6·3 per cent for women and 10·3 per cent for all persons.

TABLE 35.   Unemployment percentages—Bristol, Bristolian and Migrant, Men 21–64

	Aircraft	Build-ing and Public Works	Distri-butive	Trans-port (all)	Others	Total	Total less Aircraft
Bristol area	1·5	19 8	10·2	9·8	9·9	10·2	11·7
Bristolians	1·2	19·4	9·8	9·5	9·4	10·0	11·2
Migrants	2·1	21·7	12·8	13·1	14·8	11·7	16·0
South-Western	2·3	16·6	11·2	8·6	10·4	9·6	11·9
Wales	1·3	23·9	13·5	14·2	20·2	14·1	20·1
Midlands	2·6	30·8	10·9	5·2	15·0	10·8	15·9
South-Eastern	3·0	16·9	22·1	18·6	18·0	14·1	18·7
London	3·7	34·0	15·0	15·4	14·0	14·1	17·3
North-Western	2·8	25·3	14·5	27·5	13·6	10·9	17·8
North and North-Eastern	0·7	19·5	14·5	20·4	14·0	10·0	16·4
Scotland and Northern Ireland	2·7	34·8	15·4	20·8	16·5	11·3	20·9

The first line gives the percentages for the area, the second for native Bristolians, and the third for the migrants; and the remaining lines give the percentages for the migrants from the various Ministry of Labour divisions. While the absolute figures behind the percentages are small in some cases and decimal calculations perhaps out of place, the general lesson is unmistakable. In all industries the native workman is at an advantage over his migrant competitor, though in some industries natives of the surrounding division (principally, the fringing exchanges and the surrounding counties of Gloucester, Somerset and Wiltshire) are slightly better off in employment record. The high percentage of unemployment among Welsh

migrants is perhaps not surprising, for many of them, we may suppose, would have a long history of unemployment behind them. It is surprising to find equally high percentages of unemployment among migrants from London and the South-East, with very high percentages in the building and distributive trades. The general difference between the Bristolian and the migrant is greatest in the miscellaneous group, which contains Bristol's older staple industries—though comparison is complicated by the medley of statistical weights behind the relevant percentages.

We can carry a little further this conclusion that the migrant is at a disadvantage compared with the native. The following table makes, for men 16–64, a comparison with Great Britain and Northern Ireland:

TABLE 36.   Unemployment, National, Bristol, Bristolian and Migrant, Men 16–64, percentages

	Motors, Aircraft, Cycles	Build-ing and Public Works	Distri-butive	Trans-port	Others	Total	Total less Motors, etc.
Bristol area	1·4	18·7	8·9	9·1	9·0	9·2	10·6
Bristolians	1·1	18·3	8·4	8·7	8·5	8·9	10·0
Migrants	2·1	21·0	12·9	13·8	14·5	11·5	15·8
Great Britain and Northern Ireland	7·6	18·8	9·9	13·4	12·6	13·0	13·2

Even with younger men added in, the native Bristolian had a lower unemployment than the migrant everywhere, with the differential greatest once more in the older industries merged in 'Others'. Broadly, too, the migrant in Bristol is worse off than the nation as a whole, though true comparison is made difficult through the influence of the statistical weights behind the percentages.

This last point involves the question of 'standardizing' the unemployment rates. But before moving on to this, we may give some further inter-Bristol comparisons. If we ignore the special cases of fishing and agriculture, we have (in the unprinted details) particulars of 43 industries and groups. In 30 of these, migrant unemployment for men 16–64 was higher than the corresponding Bristolian unemployment; and in 13 industries it was lower. But the 30 industries accounted for some 90 per cent of the migrants—they accounted for 13,183 migrants 16–64 out of 14,633 and for 1,491 unemployed migrants out of 1,670. The general lesson still stands. Migrant unemployment was higher than native unemployment in 30 industries out of 43, and these 30 industries are easily the most important.

Turning to the national figures (Great Britain and Northern Ireland), we can compare the local experience with the national as follows for the 43 industries and groups:

	Higher than national	Lower than national	All
Bristol area percentage	16	27	43
Bristolian percentage	13	30	43
Migrant percentage	25	18	43

Thus, for the migrant his unemployment percentage was higher than the national in 25 industries and lower in 18. And so on.

We can now take up the question of 'standardizing' the unemployment rates. We have already partially adjusted in Table 35 in the final column by

omitting the aircraft industry and all its peculiarities, but the process needs to be carried further. A low rate of unemployment among Bristolians compared with migrants might result from their being (e.g.) better workmen or being (e.g.) predominantly occupied in industries with a low unemployment, just as a low death-rate might arise from the inherent healthiness of a place or from its having an unusually large proportion of young people. A standardizing process, indeed many standardizing processes, need to be applied to the specific unemployment rates to separate out further the influence of the migrancy characteristic on unemployment.

We take separately, therefore, the unemployment percentages Bristolian and migrant for each of the 43 industries and groups and 'weight' them by the relative importance of the industries in the Bristol area. With the weighting the same we have removed the effect of the differential distribution of Bristolians and migrants over the industries of the Bristol area. The following are the results:

TABLE 37.   'Standardized' unemployment, Bristolian and
Migrant, Men 16–64, percentages

Bristol area unemployed percentage	9·3
'Weighted' percentage, Bristolians	9·1
'Weighted' percentage, migrants	11·6

It may be mentioned that if the national 'specific' unemployment percentages of the 43 industries be weighted by the Bristol area weights, the national average would be 11·0 per cent.

The previous conclusion is confirmed, or more nearly so. When allowance is made for the differential distribution of natives and migrants over the various industries, the migrant still has the higher unemployment. Indeed, his unemployment is higher than the national correspondingly weighted.

This kind of standardizing suffers, of course, from the fact that industries have not the same classificatory validity as (e.g.) age groups. It does not entirely remove weighting, especially if a few industries are inextricably merged into a group. Thus, what is officially called 'Motor Vehicles, Cycles and Aircraft' has those three components in national and official figures, but in Bristol we are reasonably certain that it is all, or nearly all, 'Aircraft'—which undoubtedly explains the difference in the relevant percentages of Table 36 above. Difficulties of this kind lie hidden in all comparisons, especially as between local figures and national. And the assignment of men to industries might occasionally be slightly arbitrary in a way not found in (e.g.) age groups.

This kind of standardizing, which is reasonably applicable and possible, is only one of many others needed to separate out more clearly the influence of the migrancy characteristic on unemployment, but these are unfortunately not possible. There are, for example, specific unemployment rates relating to age. Younger men have lower rates than older men in general, and so on. But correction here is not feasible. In an a priori way, however, we might surmise that migrants are on the whole younger than the body of workers they migrate into and the general effect of this factor would be to make migrant unemployment *lower* than native unemployment. On the other hand, since some or much unemployment is of the 'between jobs' type and since the migrant, especially if his migration is recent, may well be deemed unusually

subject to this, migrant unemployment should be *higher*. Equally, too, if there is any tendency on the part of employers when reducing staff to dismiss the migrant rather than the native, especially if the migrant is more nearly the newcomer. But again, correction along these and other lines is not possible and we must rest content with a standardization through industrial weighting.

The migrant then, because a migrant, suffers a disadvantage. He also suffers from his mal-distribution over the industries of the area where he has migrated. This is shown by the unadjusted figures, such as in Table 35 or Table 36. Undirected migration may lead a migrant out of a very bad hole but not necessarily into a much better one. The existence of the differential indicates a defect in the machinery of national adjustment or in the migrant, plus also some amount of local prejudice, or a mixture of all factors. This is a subject on which more facts might well be collected and to which more attention might be directed.

The same type of result, but with a much more marked difference in fate, is found for women. As follows:

TABLE 38.   Unemployment, National, Bristol, Bristolian and Migrant, Women 16–64, percentages

	Distri-butive	Hotels, Clubs, etc.	Food, Drink, Tobacco	Prof. Services	Others	Total
Bristol area	3·6	7 9	4·3	2·2	5 2	4·7
Bristolians	3 3	5·5	4 0	1 6	4·6	4·2
Migrants	10·8	22·8	14 4	10 0	18·0	15·1
Great Britain and Northern Ireland	5·8	9·7	8·7	1·9	13·3	11·0

Again the migrant is at a disadvantage, unequivocally so when comparability is preserved. The total number of women migrants (16–64) is small—1,943 in all—and will not bear the more elaborate calculations applied to men. But despite the hotchpotch of weights, the results are in keeping with the march of the figures generally. The four groups given (Distributive, Hotels, Food and Professional Services) accounted for 1,359 women migrants out of 1,943 in all, and in these groups comparability is reasonably direct. The exclusion of textiles everywhere only changes the second place decimals for the area and, for Bristolians, reduces the migrant 15·1 per cent to 14·5 and the national 11 per cent to 10·7. We are reasonably sure that women migrants, because migrant, have a greater differential unemployment than men migrants.

5

In summary we may say that the Bristol area has recently shown a high rate of absorption of migrants, but that the industrial growth of Bristol and consequently the direction of the influx of migrants both show a strong disproportion towards aircraft, followed by building and distribution. The growth and the direction may have elements of danger especially if the rearmament policy slows down. Finally, unemployment remains high among migrants—higher than among Bristolians and even higher than the national average, an argument perhaps for a more controlled flow and distribution of the people geographically and industrially.

TABLE A. Insured Men 21–64, Bristol Area, July 1938: By Industries, All Men (inclusive and exclusive of foreign bulk exchange); Migrant Men and their geographical origin; and special categories

| INDUSTRY | All Bristol | | MIGRANTS | | | | | | | | |
| | Bristol (a) | Bristol (b) | South-Western | | | | Wales | | | Midlands | |
			Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs, Warwick, Worcester	Rest of Midlands
Fishing	2	2	.	.	.	.	.	.	.	.	.
Mining	443	443	35	17	1	.	61	26	6	4	4
Non-metalliferous M.P.	465	459	16	11	3	1	12	7	3	4	1
Bricks, etc. Making	773	763	44	13	.	1	17	14	4	8	10
Pottery, Earthenware, etc.	284	284	3	2	.	.	3	.	.	1	.
Glass	119	119	.	1	1	.	1	1	.	2	.
Chemicals, Paints, Oils, etc.	2,298	2,234	28	29	3	2	22	11	.	2	1
Brass, Zinc, etc. Mnfg.	1,594	1,594	10	21	6	5	187	47	14	9	.
Other Metal Manufacture	220	220	.	1	.	.	8	4	1	1	.
General Engineering	3,042	2,976	18	52	11	5	51	25	4	18	35
Other Engineering	863	810	4	19	2	2	12	6	1	11	7
Motors, Cycles, Aircraft	14,068	14,008	273	691	139	89	892	296	120	301	85
Other Vehicle Construction, etc.	455	455	5	21	4	5	7	3	2	5	3
Shipbuilding and Ship Repairing	822	822	11	3	4	3	19	14	2	3	1
Other Metal Industries	1,793	1,676	10	21	11	3	29	19	1	13	4
Textiles	222	222	11	5	.	.	1	3	.	1	.
Leather and Leather Goods	540	540	3	9	3	1	6	2	1	2	1
Clothing, Boots, etc.	2,467	2,444	12	23	4	4	17	3	2	4	9
Bread, Biscuits, etc.	987	977	10	31	10	3	20	7	3	4	1
Grain Milling	1,194	1,190	16	24	15	3	40	13	4	4	3
Cocoa, Chocolate, etc.	537	537	4	4	1	.	1	.	1	.	.
Other Food, Drink, Tobacco	4,301	4,263	16	33	3	2	24	10	2	7	3
Furniture, etc.	1,737	1,729	10	49	15	1	25	11	1	16	7
Other Woodworking, etc.	959	959	6	10	2	2	8	1	.	3	.
Cardboard Boxes, etc.	3,045	3,020	14	33	19	6	15	4	'2	8	8
Printing, Publishing, etc.	1,626	1,613	5	55	25	7	25	11	5	20	7
Other Paper, Printing, etc	1,047	1,047	4	10	4	1	18	3	2	1	1
Building and Decorating	12,401	11,796	336	354	67	26	474	198	31	46	35
Public Works Contracting	2,818	2,802	45	44	14	11	167	53	10	15	11
Other Mnfg. Industries	853	853	2	16	.	3	4	4	1	4	1
Gas, Water, Electricity	2,468	2,412	116	53	7	8	70	17	5	7	5
Railway Service	1,753	1,366	22	41	2	.	23	12	5	10	34
Tram and Bus Service	2,810	2,804	21	30	5	3	26	9	.	5	1
Road Transport (P. & G.)	2,250	2,201	33	90	19	11	26	14	2	5	6
Shipping Service	1,861	1,616	10	16	18	18	71	11	10	2	1
Docks and Harbour, etc.	2,832	2,832	54	6	6	1	26	10	2	4	6
Other Transport, etc.	249	249	.	2	.	.	3	3	.	3	.
Distributive Trades	12,356	11,805	104	537	144	69	249	70	36	57	35
Commerce, Banking, etc.	376	376	.	9	2	1	5	1	.	8	.
National Government	1,152	988	12	19	12	7	26	7	3	8	5
Local Government	1,731	1,731	36	28	9	3	64	17	3	9	8
Professional Services	1,258	1,250	20	42	6	3	15	8	3	2	4
Entertainment, etc.	625	612	6	30	9	5	13	6	.	4	8
Other Miscellaneous Trades, etc.	2,015	1,998	15	51	25	15	54	20	3	16	2
Agricultural	1,564	1,560	41	24	2	4	11	4	1	4	.
GRAND TOTALS	97,275	94,657	1,441	2,580	633	334	2,848	1,005	296	656	353

Note: Bristol (a)=Inclusive of foreign Bulk Exchange.
Bristol (b)=Exclusive of foreign Bulk Exchange.

INDUSTRY	MIGRANTS								Special categories			
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	Ex-Forces	'Clifton'	Training Centre	'Bulk Exchange'
Fishing	·	·	·	·	·	1	·	1	1	·	·	·
Mining	1	1	·	1	1	·	·	158	13	1	20	·
Non-metalliferous M.P.	·	2	·	1	2	1	·	64	29	·	1	6
Bricks, etc. Making	3	1	4	2	3	·	·	124	38	1	2	10
Pottery, Earthenware, etc.	·	1	1	·	·	·	·	11	9	·	·	·
Glass	1	·	11	1	1	·	·	20	3	·	1	·
Chemicals, Paints, Oils, etc.	6	11	10	3	4	2	1	135	140	4	2	64
{ Brass, Zinc, etc. Mnfg.	12	14	15	5	8	16	1	370	196	2	4	·
{ Other Metal Manufacture	·	1	·	1	·	·	·	17	3	·	9	·
{ General Engineering	17	20	26	9	11	7	1	310	84	1	4	66
{ Other Engineering	1	6	6	4	1	2	·	84	27	·	·	53
{ Motors, Cycles, Aircraft	165	218	399	133	153	197	63	4,214	965	29	5	60
{ Other Vehicle Construction, etc.	2	5	1	1	·	·	·	64	7	2	1	·
Shipbuilding and Ship Repairing	4	2	7	10	2	3	·	88	25	·	1	·
Other Metal Industries	6	20	19	10	11	4	2	183	52	6	1	117
Textiles	·	4	6	·	3	1	·	35	13	1	7	·
Leather and Leather Goods	2	3	5	·	·	·	·	38	6	2	1	·
Clothing, Boots, etc.	2	16	7	·	1	·	1	105	20	7	2	23
{ Bread, Biscuits, etc.	8	12	3	·	2	2	·	116	17	3	2	10
{ Grain Milling	5	9	10	·	5	6	1	158	41	8	1	4
{ Cocoa, Chocolate, etc.	3	7	·	1	1	2	·	25	5	1	·	·
{ Other Food, Drink, Tobacco	12	31	8	·	5	5	1	162	86	6	5	38
{ Furniture, etc.	8	11	4	1	2	1	1	163	25	14	5	8
{ Other Woodworking, etc.	1	4	8	1	3	1	·	50	17	3	2	·
{ Cardboard Boxes, etc.	13	22	27	1	9	5	·	186	68	1	·	25
{ Printing, Publishing, etc.	15	14	16	5	5	6	1	222	32	4	3	13
{ Other Paper, Printing, etc.	1	7	3	2	2	4	·	63	99	·	·	·
{ Building and Decorating	55	71	64	46	51	22	8	1,884	592	39	29	605
{ Public Works Contracting	22	32	11	11	10	10	6	480	178	7	13	16
Other Mnfg. Industries	3	14	6	·	6	1	·	65	6	1	·	·
Gas, Water, Electricity	17	11	10	4	4	5	1	340	124	4	1	56
{ Railway Service	4	1	4	1	·	1	·	160	85	2	5	387
{ Tram and Bus Service	1	5	1	4	2	2	·	115	175	·	2	6
{ Road Transport (P. & G.)	12	30	7	4	5	4	1	269	111	15	3	49
{ Shipping Service	21	27	46	17	9	25	10	312	45	1	6	245
{ Docks and Harbour, etc.	5	11	11	3	3	4	1	153	108	·	·	·
{ Other Transport, etc.	·	4	·	·	1	·	·	16	19	·	·	·
Distributive Trades	77	140	55	22	33	20	6	1,654	348	70	33	551
Commerce, Banking, etc.	2	6	2	·	·	1	·	32	7	4	1	·
{ National Government	5	15	4	4	5	1	2	135	183	3	7	164
{ Local Government	10	19	11	4	4	7	1	233	140	3	3	·
{ Professional Services	8	19	3	3	5	4	1	146	59	16	·	8
{ Entertainment, etc.	3	13	10	2	4	2	1	116	50	7	4	13
{ Other Miscellaneous Trades, etc.	24	48	12	3	8	6	·	302	232	17	29	17
Agricultural	10	3	3	·	3	2	1	113	18	20	5	4
GRAND TOTALS	567	911	864	320	388	383	112	13,691	4,501	305	220	2,618

TABLE B. Insured Men 16–20, Bristol Area, July 1938: By Industries, All Men (inclusive and exclusive of foreign bulk exchange); Migrant Men and their geographical origin; and special categories

INDUSTRY	All Bristol		MIGRANTS								
			South-Western				Wales			Midlands	
	Bristol (a)	Bristol (b)	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants, Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs, Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	41	41	3	.	.	.	4	.	.	.	.
Non-metalliferous M.P.	42	39	2	.	.	.	.	1	1	.	.
Bricks, etc. Making	154	154	12	.	.	.	1	.	.	.	.
Pottery, Earthenware, etc.	47	47	1	.	.	.	.	.	.	.	.
Glass	26	26	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	340	334	2	1	2	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	143	143	.	2	.	.	3	1	1	1	.
Other Metal Manufacture	54	54	.	.	.	.	.	.	3	.	.
General Engineering	876	873	6	7	1	.	9	4	2	1	1
Other Engineering	115	108	.	1	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	3,072	3,057	75	61	16	8	84	35	14	18	6
Other Vehicle Construction, etc.	45	45	.	1	.	.	1	1	.	.	.
Shipbuilding and Ship Repairing	101	101	.	1	.	1	1	.	.	1	.
Other Metal Industries	649	637	1	6	5	.	6	2	.	.	.
Textiles	71	71	3	.	.	.	1	.	.	.	.
Leather and Leather Goods	112	112	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	333	331	.	1	.	.	.	.	.	.	1
Bread, Biscuits, etc.	157	155	4	2	2	.	2	.	.	.	.
Grain Milling	171	171	1	1	.	.	2	.	.	.	.
Cocoa, Chocolate, etc.	80	80	1	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	702	685	4	7	1	.	1	1	.	.	2
Furniture, etc.	606	603	5	4	1	.	1	.	.	1	.
Other Woodworking, etc.	206	206	3	1	.	.	.	.	.	.	.
Cardboard Boxes, etc.	543	539	2	1	.	.	.	1	.	1	.
Printing, Publishing, etc.	358	358	.	3	.	1	.	.	.	1	.
Other Paper, Printing, etc.	236	236	1	.	2	.	1	3	.	.	.
Building and Decorating	1,243	1,196	31	22	5	.	12	7	3	.	2
Public Works Contracting	76	76	1	1	.	1	3	.	1	.	.
Other Mnfg. Industries	213	213	.	3	.	.	.	.	.	.	.
Gas, Water, Electricity	388	377	14	11	.	.	1	.	.	.	.
Railway Service	654	649	4	8	3	.	2	1	.	1	.
Tram and Bus Service	202	202	2	1	.	.	1	.	.	.	.
Road Transport (P. & G.)	203	198	.	2	1	.	1	2	.	.	.
Shipping Service	234	211	.	2	2	.	2	1	3	.	1
Docks and Harbour, etc.	111	111	1	.	.	1	.	.	1	.	.
Other Transport, etc.	17	17	.	.	.	.	.	.	.	.	1
Distributive Trades	3,247	3,141	20	43	16	6	17	4	5	7	3
Commerce, Banking, etc.	84	84	.	1	1	1	.	.	.	.	.
National Government	117	91	1	3	.	.	.	.	.	1	.
Local Government	160	160	4	2	.	.	3	.	.	.	.
Professional Services	233	232	.	1	.	.	1	.	.	.	.
Entertainment, etc.	131	130	.	2	.	.	2	.	.	1	2
Other Miscellaneous Trades, etc.	406	402	.	4	7	3	5	5	1	4	.
Agricultural	156	151	2	4	1	.	.	1	.	.	.
GRAND TOTALS	17,155	16,847	206	210	66	22	167	70	35	38	19

Note: Bristol (a) = Inclusive of foreign Bulk Exchange.
      Bristol (b) = Exclusive of foreign Bulk Exchange.

| INDUSTRY | MIGRANTS | | | | | | | | Special categories | | |
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	Training Centre	'Bulk Exchange'
Fishing	.	.		.	.	.	.	.	.	.	.
Mining	.	.	.	1	.	.	.	8	.	12	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	4	.	1	3
Bricks, etc. Making	.	.	.	.	.	.	.	13	1	3	.
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	1	.	.	.
Glass	.	.	.	.	.	.	.	.	.	2	.
Chemicals, Paints, Oils, etc.	.	1	.	.	.	.	.	6	2	1	6
{Brass, Zinc, etc. Mnfg.	.	1	.	.	.	.	.	9	.	1	.
{Other Metal Manufacture	.	.	.	.	.	.	.	3	.	11	.
{General Engineering	1	1	3	1	1	.	.	38	4	2	3
{Other Engineering	.	2	.	.	1	.	.	4	.	4	7
{Motors, Cycles, Aircraft	18	15	25	10	9	3	4	401	10	7	15
{Other Vehicle Construction, etc.	.	.	.	.	.	.	.	3	.	2	.
Shipbuilding and Ship Repairing	1	.	1	1	.	.	.	7	.	3	.
Other Metal Industries	.	6	.	.	1	.	.	27	.	4	12
Textiles	1	.	.	1	2	1	.	9	2	9	.
Leather and Leather Goods	.	.	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	.	2	.	.	.	.	.	4	1	.	2
{Bread, Biscuits, etc.	1	.	.	1	1	.	.	13	1	.	2
{Grain Milling	1	1	.	.	.	.	.	6	.	.	.
{Cocoa, Chocolate, etc.	.	.	.	.	1	.	.	2	1	.	.
{Other Food, Drink, Tobacco	1	2	.	.	1	2	.	22	2	1	17
{Furniture, etc.	.	2	2	.	.	.	.	16	3	5	3
{Other Woodworking, etc.	.	.	.	.	.	.	.	4	1	.	.
{Cardboard Boxes, etc.	.	1	.	.	.	.	.	6	.	.	4
{Printing, Publishing, etc.	2	1	1	.	1	.	.	10	1	1	.
{Other Paper, Printing, etc.	.	.	.	.	.	.	.	7	.	1	.
{Building and Decorating	5	4	1	.	1	3	1	97	2	13	47
{Public Works Contracting	2	1	.	.	.	.	.	10	.	1	.
Other Mnfg. Industries	1	1	.	.	.	.	.	5	1	2	.
Gas, Water, Electricity	.	1	1	.	.	.	.	28	.	.	11
{Railway Service	.	.	3	.	.	.	.	22	.	1	5
{Tram and Bus Service	.	.	.	.	.	.	.	4	.	.	.
{Road Transport (P. & G.)	.	2	.	.	.	1	.	9	1	.	5
{Shipping Service	2	.	1	1	.	.	3	18	1	2	23
{Docks and Harbour, etc.	.	1	1	.	.	.	.	5	1	.	.
{Other Transport, etc.	.	.	.	.	.	.	.	1	.	.	.
Distributive Trades	6	16	4	3	4	3	2	159	16	28	106
Commerce, Banking, etc.	1	.	.	.	.	.	.	4	.	.	.
{National Government	.	.	.	.	.	.	1	6	2	1	26
{Local Government	.	.	.	1	.	.	.	10	1	1	.
{Professional Services	.	1	.	.	.	1	.	4	2	.	1
{Entertainment, etc.	2	1	2	1	.	.	.	13	.	2	1
{Other Miscellaneous Trades, etc.	3	3	1	.	.	.	.	36	3	15	4
Agricultural	.	1	2	.	.	.	1	12	6	4	5
GRAND TOTALS	48	67	48	21	23	14	12	1,066	65	140	308

TABLE C. Insured Boys 14–15, Bristol Area, July 1938: By Industries, All Boys (inclusive and exclusive of foreign bulk exchange); Migrant Boys and their geographical origin; and special categories

Industry	All Bristol		Migrants								
			South-Western				Wales			Midlands	
	Bristol (a)	Bristol (b)	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining											
Non-metalliferous M.P.	7	7	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	21	21	.	1	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	28	28	1	.	.	.	.	.	.	.	.
Glass	2	2	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	76	76	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	32	32	.	.	.	.	.	3	.	.	.
Other Metal Manufacture	14	14	.	1	.	.	.	.	.	.	.
General Engineering	298	298	4	1	1	.	1	1	.	.	.
Other Engineering	46	45	.	.	.	.	.	.	.	1	.
Motors, Cycles, Aircraft	811	807	41	8	2	2	2	2	.	2	1
Other Vehicle Construction, etc.	31	31	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	32	32	.	.	.	.	.	.	.	.	.
Other Metal Industries	268	260	1	4	1	.	1	.	.	.	.
Textiles	19	19	2	.	1	.	.	2	.	.	.
Leather and Leather Goods	19	19	.	.	.	.	.	2	.	.	.
Clothing, Boots, etc.	164	163	.	1	.	.	.	.	.	.	.
Bread, Biscuits, etc.	96	96	1	.	.	.	.	.	.	.	.
Grain Milling	15	15	.	.	.	.	.	1	.	.	.
Cocoa, Chocolate, etc.	63	63	.	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	131	131	.	1	1	.	.	.	.	.	.
Furniture, etc.	258	258	1	1	.	.	.	.	.	.	.
Other Woodworking, etc.	131	131	.	.	.	.	.	.	.	1	.
Cardboard Boxes, etc.	204	203	2	1	.	.	.	.	.	.	.
Printing, Publishing, etc.	197	196	1	1	.	.	.	1	.	.	.
Other Paper, Printing, etc.	33	33	2	.	.	.	.	.	.	.	.
Building and Decorating	307	302	14	6	.	.	2	2	.	.	.
Public Works Contracting	14	13	.1	.	.	.	.	.	.	.	.
Other Mnfg. Industries	121	121	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	37	33	5	5	.	.	.	.	.	.	.
Railway Service	23	23	.	1	.	.	.	.	.	.	.
Tram and Bus Service	24	24	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	54	54	.	1	.	1	.	.	.	.	.
Shipping Service	21	18	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	13	13	2	.	.	.	.	.	.	.	.
Other Transport, etc.	10	10	.	.	.	.	.	.	.	2	.
Distributive Trades	1,240	1,173	5	6	4	1	4	.	.	.	.
Commerce, Banking, etc.	33	33	.	.	.	.	.	.	.	.	.
National Government	34	34	.	.	.	.	.	.	.	.	.
Local Government	24	24	.	.	.	.	.	.	.	.	.
Professional Services	94	92	.	.	.	.	.	.	.	.	.
Entertainment, etc.	40	38	.	.	.	.	.	1	.	.	.
Other Miscellaneous Trades, etc.	145	145	1	1	1	1	1	.	.	.	.
Agricultural	50	49	2	1	.	.	.	.	.	.	.
GRAND TOTALS	5,280	5,179	86	41	11	5	16	8	.	6	1

Note: Bristol (a) = Inclusive of foreign Bulk Exchange.
Bristol (b) = Exclusive of foreign Bulk Exchange.

INDUSTRY	MIGRANTS								Special categories		
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	Training Centre	'Bulk Exchange'
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	.	.	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	1	.	.	.
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	1	.	.	.
Glass	.	.	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	.	.	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	1	.	.	.	.	.	.	4	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	1	.	.	.
General Engineering	1	1	.	.	.	.	.	10	2	.	.
Other Engineering	.	.	.	.	.	.	.	1	.	.	1
Motors, Cycles, Aircraft	3	.	1	.	3	.	.	67	1	.	4
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	.	.	.	.	.	.	.	7	1	.	8
Textiles	1	.	.	.	.	.	.	4	.	.	.
Leather and Leather Goods	.	.	.	.	.	.	.	2	.	.	.
Clothing, Boots, etc.	.	1	.	.	.	.	.	2	.	.	1
Bread, Biscuits, etc.	.	.	` .	` .	.	.	.	1	.	.	.
Grain Milling	.	.	.	.	.	.	.	1	1	.	.
Cocoa, Chocolate, etc.	.	.	.	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	.	.	.	.	1	.	.	3	.	.	.
Furniture, etc.	.	.	.	.	.	.	.	2	1	.	.
Other Woodworking, etc.	.	2	.	.	.	.	.	3	1	.	.
Cardboard Boxes, etc.	.	.	.	.	.	.	.	3	.	.	1
Printing, Publishing, etc.	.	.	.	.	.	.	.	3	.	.	1
Other Paper, Printing, etc.	.	.	.	.	.	.	.	2	.	.	.
Building and Decorating	.	.	.	.	.	.	1	25	3	.	5
Public Works Contracting	.	.	.	1	.	,	.	2	.	.	1
Other Mnfg. Industries	.	.	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	.	.	.	.	.	.	.	10	.	.	4
Railway Service	.	.	.	.	.	.	.	1	.	.	.
Tram and Bus Service	.	.	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	.	1	.	.	.	.	.	3	.	.	.
Shipping Service	.	.	.	.	.	.	.	.	.	.	3
Docks and Harbour, etc.	.	.	.	.	.	.	.	2	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	2	1	2	1	1	.	.	29	6	.	67
Commerce, Banking, etc.	.	.	.	.	.	.	.	.	.	.	.
National Government	.	.	.	.	.	.	.	.	.	.	.
Local Government	.	.	.	.	.	.	.	.	.	.	.
Professional Services	.	.	.	.	.	.	.	.	.	.	2
Entertainment, etc.	.	.	.	.	.	.	.	1	2	.	2
Other Miscellaneous Trades, etc.	.	.	.	.	.	.	.	5	.	.	.
Agricultural	.	.	.	.	.	.	.	3	1	.	1
GRAND TOTALS	8	6	3	2	5	.	1	199	19	.	101

TABLE D.   Insured Men 21–64, Unemployed, Bristol Area: By Industries, All Men (18th July 1938); Migrant Men (3rd July) and their geographical origin; and special categories

INDUSTRY	All Bristol	MIGRANTS								
		South-Western				Wales			Midlands	
	Bristol	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	155	2	3	.	.	47	13	3	1	1
Non-metalliferous M.P.	42	4	.	1	1	1	1	.	.	.
Bricks, etc. Making	36	.	.	.	.	1	1	.	.	1
Pottery, Earthenware, etc.	44	.	.	.	.	2	.	.	.	.
Glass	11	.	.	.	.	1	.	.	.	.
Chemicals, Paints, Oils, etc.	179	1	4	.	.	7	.	.	.	.
Brass, Zinc, etc. Mnfg.	57	.	2	1	.	7	5	.	.	.
Other Metal Manufacture	164	.	.	.	.	6	2	1	1	.
General Engineering	121	4	4	1	.	3	3	.	1	.
Other Engineering	78	1	3	1	1	.	.	.	1	2
Motors, Cycles, Aircraft	204	5	15	2	6	15	1	1	7	3
Other Vehicle Construction, etc.	8	.	.	.	.	1	1	.	.	.
Shipbuilding and Ship Repairing	182	5	.	1	1	3	4	.	.	.
Other Metal Industries	168	1	2	1	3	7	2	.	4	1
Textiles	41	1	.	.	.	.	1	.	.	.
Leather and Leather Goods	89	.	.	.	.	1	.	.	1	.
Clothing, Boots, etc.	541	5	3	1	1	2	1	.	.	.
Bread, Biscuits, etc.	76	.	.	.	.	2	2	1	.	1
Grain Milling	55	2	.	1	.	3	.	2	.	1
Cocoa, Chocolate, etc.	152	.	.	.	.	1	.	.	.	.
Other Food, Drink, Tobacco	195	1	2	1	.	3	1	1	1	2
Furniture, etc.	196	2	3	3	.	3	1	1	1	.
Other Woodworking, etc.	70	1	.	.	.	1	.	.	.	.
Cardboard Boxes, etc.	59	.	.	.	.	1	.	.	.	.
Printing, Publishing, etc.	167	.	4	4	2	3	2	.	3	3
Other Paper, Printing, etc.	33	.	.	.	.	1	.	.	.	.
Building and Decorating	1,740	28	51	10	2	90	30	6	8	8
Public Works Contracting	1,148	20	24	7	7	72	21	4	10	7
Other Mnfg. Industries	45	.	1	.	.	1	2	1	2	1
Gas, Water, Electricity	106	5	7	1	.	16	9	1	.	.
Railway Service	127	.	1	.	.	3	1	1	.	.
Tram and Bus Service	53	.	.	.	.	1	1	.	.	.
Road Transport (P. & G.)	252	2	8	1	1	.	.	1	2	.
Shipping Service	274	1	3	2	6	19	2	1	.	.
Docks and Harbour, etc.	325	9	.	1	.	3	2	.	.	1
Other Transport, etc.	54	.	.	.	.	1	.	.	1	.
Distributive Trades	1,204	9	55	24	8	33	10	5	6	4
Commerce, Banking, etc.	65	.	1	.	.	.	.	.	1	.
National Government	169	2	5	2	3	8	3	.	1	2
Local Government	334	5	5	3	1	23	3	1	3	3
Professional Services	48	.	1	.	.	2	1	.	.	1
Entertainment, etc.	126	.	7	1	.	5	1	.	3	2
Other Miscellaneous Trades, etc.	388	3	13	7	1	10	9	9	5	.
Agricultural	93	7	4	1	.	2	.	.	2	.
GRAND TOTALS	9,674	126	231	78	44	411	136	40	65	44

INDUSTRY	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	Ex-Forces	'Clfton'	Training Centre
			MIGRANTS						Special categories		
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	1	.	.	1	.	.	.	72	6	.	20
Non-metalliferous M.P.	.	.	.	1	.	.	.	9	4	.	1
Bricks, etc. Making	1	.	.	.	1	.	.	5	5	.	2
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	2	1	.	.
Glass	.	.	.	.	.	.	.	1	.	.	1
Chemicals, Paints, Oils, etc.	.	1	2	.	2	.	.	17	17	.	2
Brass, Zinc, etc. Mnfg.	1	.	.	.	.	.	.	16	18	.	1
Other Metal Manufacture	.	1	.	.	.	.	.	11	1	.	9
General Engineering	1	2	4	2	.	2	.	27	5	1	4
Other Engineering	.	1	1	1	.	1	.	13	4	.	.
Motors, Cycles, Aircraft	5	8	11	.	2	5	2	88	32	.	5
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	2	.	.	1
Shipbuilding and Ship Repairing	1	.	2	2	.	1	.	20	1	.	1
Other Metal Industries	1	4	1	2	2	1	2	34	9	.	4
Textiles	.	.	1	.	.	.	.	3	1	.	7
Leather and Leather Goods	.	.	.	.	.	.	.	2	1	.	1
Clothing, Boots, etc.	.	2	2	.	.	.	.	17	2	.	2
Bread, Biscuits, etc.	2	1	1	.	.	.	.	10	1	.	2
Grain Milling	.	.	.	.	.	.	.	9	2	.	1
Cocoa, Chocolate, etc.	.	1	.	1	1	1	.	5	3	1	.
Other Food, Drink, Tobacco	2	3	1	.	.	.	.	18	12	.	5
Furniture, etc.	4	.	.	.	.	.	.	18	3	1	5
Other Woodworking, etc.	.	1	1	.	2	.	.	6	.	.	2
Cardboard Boxes, etc.	.	.	1	.	.	.	.	2	2	.	.
Printing, Publishing, etc.	4	2	2	1	.	1	.	31	8	.	3
Other Paper, Printing, etc.	.	1	.	.	.	.	.	2	3	.	.
Building and Decorating	8	20	13	7	7	6	1	295	125	3	29
Public Works Contracting	5	15	8	6	3	6	3	218	73	1	13
Other Mnfg. Industries	.	1	1	.	.	.	.	10	1	.	.
Gas, Water, Electricity	.	3	1	.	.	2	.	45	40	.	1
Railway Service	1	.	1	.	.	.	.	8	5	.	5
Tram and Bus Service	.	.	.	.	.	.	.	2	4	.	2
Road Transport (P. & G.)	1	3	1	.	1	1	.	22	17	.	3
Shipping Service	5	7	14	4	4	6	3	77	13	.	6
Docks and Harbour, etc.	1	1	3	.	1	.	.	22	16	.	.
Other Transport, etc.	.	1	.	.	.	.	.	3	9	.	.
Distributive Trades	17	21	8	5	3	3	1	212	60	2	33
Commerce, Banking, etc.	1	2	1	.	.	.	.	6	1	.	1
National Government	2	2	1	1	.	.	.	32	27	.	7
Local Government	2	6	3	1	2	2	.	63	19	.	3
Professional Services	1	1	.	.	.	.	.	7	2	.	.
Entertainment, etc.	2	3	5	.	2	1	1	33	13	.	4
Other Miscellaneous Trades, etc.	9	14	3	.	2	3	.	88	115	3	29
Agricultural	2	.	1	.	1	.	1	21	5	.	5
GRAND TOTALS	80	128	94	35	36	42	14	1,604	686	12	220

TABLE E.   Insured Men 16–20, Unemployed, Bristol Area: By Industries, All Men (18th July 1938); Migrant Men (3rd July) and their geographical origin; and special categories

INDUSTRY	All Bristol	MIGRANTS								
		South-Western				Wales			Midlands	
	Bristol	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	17	.	.	.	.	3	.	.	.	.
Non-metalliferous M.P.	2	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	11	1	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	4	.	.	.	.	.	.	.	.	.
Glass	1	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	13	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	4	.	.	.	.	.	.	.	1	.
Other Metal Manufacture	19	.	.	.	.	.	.	2	.	.
General Engineering	10	.	.	1	.	.	.	.	.	.
Other Engineering	8	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	34	2	.	.	.	.	1	1	3	.
Other Vehicle Construction, etc.	1	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	10	.	.	.	.	.	.	.	.	.
Other Metal Industries	35	.	2	.	.	.	.	.	.	.
Textiles	8	.	.	.	.	1	.	.	.	.
Leather and Leather Goods	7	.	.	.	.	.	.	.	.	1
Clothing, Boots, etc.	12	.	.	.	.	.	.	.	.	.
Bread, Biscuits, etc.	13	.	.	.	.	1	.	.	.	.
Grain Milling	5	.	.	.	.	1	.	.	.	.
Cocoa, Chocolate, etc.	2	.	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	8	.	.	.	.	.	.	.	.	.
Furniture, etc.	16	.	.	.	.	.	.	.	.	.
Other Woodworking, etc.	9	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	2	.	.	.	.	.	.	.	.	.
Printing, Publishing, etc.	15	.	.	.	.	.	.	.	.	.
Other Paper, Printing, etc.	13	.	.	1	.	.	.	.	.	.
Building and Decorating	76	.	2	.	.	1	.	.	.	.
Public Works Contracting	6	.	.	.	.	1	.	.	.	.
Other Mnfg. Industries	8	.	1	.	.	.	.	.	.	.
Gas, Water, Electricity	1	.	.	.	.	.	.	.	.	.
Railway Service	11	.	1	.	.	.	1	.	.	.
Tram and Bus Service	3	2	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	12	.	.	.	.	.	.	.	.	.
Shipping Service	21	.	.	1	.	1	1	.	.	1
Docks and Harbour, etc.	2	1	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	127	1	9	3	1	2	.	.	.	1
Commerce, Banking, etc.	.	.	1	.	.	.	.	.	.	.
National Government	.	.	1	.	.	.	.	.	.	.
Local Government	5	.	.	.	.	.	.	.	.	.
Professional Services	5	.	.	.	.	.	.	.	.	.
Entertainment, etc.	8	.	.	.	.	.	.	.	.	.
Other Miscellaneous Trades, etc.	40	.	1	.	.	1	.	1	1	.
Agricultural	12	2	2	.	.	.	.	.	.	.
GRAND TOTALS	616	9	20	6	1	12	3	4	5	3

INDUSTRY	MIGRANTS								Special categories	
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	Training Centre
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	.	.	.	.	.	.	.	3	.	12
Non-metalliferous M.P.	.	.	.	.	.	.	.	.	.	1
Bricks, etc. Making	.	.	.	.	.	.	.	1	.	3
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	.	.	.
Glass	.	.	.	.	.	.	.	.	.	2
Chemicals, Paints, Oils, etc.	.	.	.	.	.	.	.	.	.	1
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	1	.	1
Other Metal Manufacture	.	.	.	.	.	.	.	2	.	11
General Engineering	1	.	.	.	.	.	.	2	.	2
Other Engineering	.	1	.	.	.	.	.	1	.	4
Motors, Cycles, Aircraft	1	2	1	.	.	.	.	11	.	7
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	.	.	2
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	2	.	3
Other Metal Industries	.	.	.	.	.	.	.	2	.	4
Textiles	.	.	.	.	.	1	.	2	.	9
Leather and Leather Goods	.	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	.	.	.	.	.	.	.	1	.	.
Bread, Biscuits, etc.	1	.	.	.	.	.	.	2	.	.
Grain Milling	.	.	.	.	.	.	.	1	.	.
Cocoa, Chocolate, etc.	.	.	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	.	.	.	.	.	.	.	.	.	1
Furniture, etc.	.	.	.	.	.	.	.	.	.	5
Other Woodworking, etc.	.	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	.	.	.	.	.	.	.	.	.	.
Printing, Publishing, etc.	.	.	.	.	.	.	.	.	.	1
Other Paper, Printing, etc.	.	.	.	.	.	.	.	1	.	1
Building and Decorating	1	1	.	.	.	1	.	6	.	13
Public Works Contracting	.	.	.	.	.	.	.	1	.	1
Other Mnfg. Industries	.	.	.	.	.	.	.	1	.	2
Gas, Water, Electricity	.	.	1	.	.	.	.	1	.	.
Railway Service	.	.	2	.	.	.	.	4	.	1
Tram and Bus Service	.	.	.	.	.	.	.	2	.	.
Road Transport (P. & G.)	.	.	.	.	.	.	.	.	.	.
Shipping Service	.	.	1	1	.	.	1	7	.	2
Docks and Harbour, etc.	.	1	1	.	.	.	.	3	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	1	2	1	1	.	.	.	22	2	28
Commerce, Banking, etc.	.	.	.	.	.	.	.	1	.	.
National Government	.	.	.	.	.	.	1	2	.	1
Local Government	.	.	.	.	.	.	.	.	.	1
Professional Services	.	.	.	.	.	.	.	.	.	.
Entertainment, etc.	.	.	1	.	.	.	.	1	.	2
Other Miscellaneous Trades, etc.	.	2	.	.	.	.	.	6	.	15
Agricultural	.	.	1	.	.	.	1	6	.	4
GRAND TOTALS	5	9	9	2	.	2	3	93	2	140

TABLE F. Insured Boys 14–15, Unemployed, Bristol Area: By Industries, All Boys (18th July 1938); Migrant Boys (3rd July) and their geographical origin; and special category

INDUSTRY	All Bristol — Bristol	MIGRANTS — South-Western — Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Wales — Glamorgan	Monmouth	Rest of Wales	Midlands — Staffs., Warwick, Worcester	Rest of Midlands
Fishing	·	·	·	·	·	·	·	·	·	·
Mining	·	·	·	·	·	·	·	·	·	·
Non-metalliferous M.P.	·	·	·	·	·	·	·	·	·	·
Bricks, etc. Making	·	·	·	·	·	·	·	·	·	·
Pottery, Earthenware, etc.	·	·	·	·	·	·	·	·	·	·
Glass	·	·	·	·	·	·	·	·	·	·
Chemicals, Paints, Oils, etc.	·	·	·	·	·	·	·	·	·	·
Brass, Zinc, etc. Mnfg.	·	·	·	·	·	·	·	·	·	·
Other Metal Manufacture	·	·	·	·	·	·	·	·	·	·
General Engineering	5	·	·	·	·	·	·	·	·	·
Other Engineering	·	·	·	·	·	·	·	·	·	·
Motors, Cycles, Aircraft	2	1	·	·	·	·	·	·	·	·
Other Vehicle Construction, etc.	·	·	·	·	·	·	·	·	·	·
Shipbuilding and Ship Repairing	·	·	·	·	·	·	·	·	·	·
Other Metal Industries	4	·	·	·	·	·	·	·	·	·
Textiles	·	·	·	·	·	·	·	·	·	·
Leather and Leather Goods	1	·	·	·	·	·	·	·	·	·
Clothing, Boots, etc.	4	·	·	·	·	·	·	·	·	·
Bread, Biscuits, etc.	3	·	·	·	·	·	·	·	·	·
Grain Milling	1	·	·	·	·	·	·	·	·	·
Cocoa, Chocolate, etc.	·	·	·	·	·	·	·	·	·	·
Other Food, Drink, Tobacco	·	·	·	·	·	·	·	·	·	·
Furniture, etc.	1	·	·	·	·	·	·	·	·	·
Other Woodworking, etc.	·	·	·	·	·	·	·	·	·	·
Cardboard Boxes, etc.	·	·	·	·	·	·	·	·	·	·
Printing, Publishing, etc.	1	·	·	·	·	·	·	·	·	·
Other Paper, Printing, etc.	1	·	·	·	·	·	·	·	·	·
Building and Decorating	5	·	1	·	·	·	·	·	·	·
Public Works Contracting	·	·	·	·	·	·	·	·	·	·
Other Mnfg. Industries	1	·	·	·	·	·	·	·	·	·
Gas, Water, Electricity	·	·	·	·	·	·	·	·	·	·
Railway Service	·	·	·	·	·	·	·	·	·	·
Tram and Bus Service	1	·	·	·	·	·	·	·	·	·
Road Transport (P. & G.)	2	·	·	·	·	·	·	·	·	·
Shipping Service	1	·	·	·	·	·	·	·	·	·
Docks and Harbour, etc.	·	·	·	·	·	·	·	·	·	·
Other Transport, etc.	·	·	·	·	·	·	·	·	·	·
Distributive Trades	13	·	·	1	·	1	·	·	·	·
Commerce, Banking, etc.	2	·	·	·	·	·	·	·	·	·
National Government	·	·	·	·	·	·	·	·	·	·
Local Government	·	·	·	·	·	·	·	·	·	·
Professional Services	·	·	·	·	·	·	·	·	·	·
Entertainment, etc.	·	·	·	·	·	·	·	·	·	·
Other Miscellaneous Trades, etc.	3	·	·	·	·	1	·	·	·	·
Agricultural	·	·	·	·	·	·	·	·	·	·
GRAND TOTALS	51	1	1	1	1	1	·	·	·	·

INDUSTRY	MIGRANTS								Special category
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'
Fishing									
Mining									
Non-metalliferous M.P.									
Bricks, etc. Making									
Pottery, Earthenware, etc.									
Glass									
Chemicals, Paints, Oils, etc.									
Brass, Zinc, etc. Mnfg.									
Other Metal Manufacture									
General Engineering		1						1	
Other Engineering									
Motors, Cycles, Aircraft					1			2	
Other Vehicle Construction, etc.									
Shipbuilding and Ship Repairing									
Other Metal Industries									
Textiles									
Leather and Leather Goods									
Clothing, Boots, etc.									
Bread, Biscuits, etc.									
Grain Milling									
Cocoa, Chocolate, etc.									
Other Food, Drink, Tobacco									
Furniture, etc.									
Other Woodworking, etc.					1				
Cardboard Boxes, etc.									
Printing, Publishing, etc.									
Other Paper, Printing, etc.									
Building and Decorating								1	
Public Works Contracting									
Other Mnfg. Industries									
Gas, Water, Electricity									
Railway Service									
Tram and Bus Service									
Road Transport (P. & G.)									
Shipping Service									
Docks and Harbour, etc.									
Other Transport, etc.									
Distributive Trades	1							3	
Commerce, Banking, etc.									
National Government									
Local Government									
Professional Services									
Entertainment, etc.									
Other Miscellaneous Trades, etc.								1	
Agricultural									1
GRAND TOTALS	1	1			1			8	1

8 G

TABLE G. Insured Women 21–64, Bristol Area, July 1938: By Industries, All Women (inclusive and exclusive of foreign bulk exchange); Migrant Women and their geographical origin; and special categories

INDUSTRY	All Bristol		MIGRANTS								
			South-Western				Wales			Midlands	
	Bristol (a)	Bristol (b)	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants, Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	5	5	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	21	21	.	1	.	.	.	.	.	.	.
Bricks, etc. Making	2	1	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	132	132	1	.	.	.	.	.	.	.	.
Glass	5	5	.	.	.	.	.	.	.	1	.
Chemicals, Paints, Oils, etc.	499	498	4	3	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	40	40	.	.	1	.	2	.	.	.	.
Other Metal Manufacture	2	2	.	.	.	.	.	.	.	.	.
General Engineering	120	119	.	1	2	.	.	.	.	.	1
Other Engineering	25	25	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	415	412	3	6	4	1	3	1	.	6	.
Other Vehicle Construction, etc.	76	76	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	5	5	.	.	.	.	.	.	.	.	.
Other Metal Industries	191	189	1	2	.	.	1	2	.	4	.
Textiles	203	203	1	1	.	.	.	.	.	.	.
Leather and Leather Goods	99	99	.	1	.	.	.	.	.	1	.
Clothing, Boots, etc.	3,385	3,376	12	15	1	1	3	1	.	3	3
Bread, Biscuits, etc.	292	292	1	1	2	.	2	1	2	2	1
Grain Milling	133	133	.	1	.	.	1	.	.	.	.
Cocoa, Chocolate, etc.	953	953	10	22	8	.	2	.	.	8	.
Other Food, Drink, Tobacco	3,535	3,515	15	12	4	1	1	.	1	2	.
Furniture, etc.	164	164	1	1	1	1	.	.	.	.	1
Other Woodworking, etc.	159	159	.	1	.	.	.	.	.	.	.
Cardboard Boxes, etc.	2,155	2,120	5	2	.	.	1	.	.	1	1
Printing, Publishing, etc.	695	694	.	3	.	1	2	.	.	2	1
Other Paper, Printing, etc.	207	207	2	.	.	.	.	.	.	.	.
Building and Decorating	61	61	.	1	.	.	.	.	.	.	.
Public Works Contracting	3	3	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	312	312	1	4	1	1	1	.	.	1	.
Gas, Water, Electricity	77	72	2	.	.	.	.	.	.	1	.
Railway Service	44	44	.	.	2	.	1	1	.	.	1
Tram and Bus Service	59	59	.	1	.	.	.	.	.	.	.
Road Transport (P. & G.)	39	39	.	.	1	.	1	.	.	1	.
Shipping Service	66	66	.	.	.	1	.	.	.	.	.
Docks and Harbour, etc.	8	8	.	.	.	.	.	.	.	.	.
Other Transport, etc.	11	11	.	.	.	.	.	.	.	.	.
Distributive Trades	5,747	5,656	49	161	40	25	38	24	2	19	18
Commerce, Banking, etc.	147	147	1	3	.	1	2	.	.	1	.
National Government	147	146	.	3	.	.	1	.	.	1	3
Local Government	462	462	4	5	4	2	.	1	.	4	2
Professional Services	1,090	1,080	4	11	8	5	5	6	4	5	6
Entertainment, etc.	338	327	6	7	5	.	2	.	.	2	.
Hotels, etc.	1,735	1,725	9	52	26	23	23	15	3	8	8
Laundry and Dry Cleaning	993	993	3	14	5	12	1	.	.	2	1
Other Miscellaneous Trades, etc.	318	317	.	9	1	1	.	.	1	1	2
Agricultural	67	67	.	.	.	.	.	.	.	.	.
GRAND TOTALS	25,242	25,040	135	344	116	76	93	52	13	76	48

Note: Bristol (a) = Inclusive of foreign Bulk Exchange.
Bristol (b) = Exclusive of foreign Bulk Exchange.

	MIGRANTS								Special categories	
INDUSTRY	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	'Bulk Exchange'
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	1	.	.	.	.	.	.	1	.	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	1	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.	1
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	1	.	.
Glass	.	.	.	.	.	.	.	1	.	.
Chemicals, Paints, Oils, etc.	1	2	4	.	.	1	.	15	1	1
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	3	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.	.
General Engineering	1	1	1	.	.	.	.	7	.	1
Other Engineering	.	1	.	.	.	.	.	1	.	.
Motors, Cycles, Aircraft	3	3	5	1	2	2	1	41	2	3
Other Vehicle Construction, etc.	.	1	1	.	.	.	.	2	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	1	1	2	.	.	1	.	15	.	2
Textiles	.	1	6	.	2	.	4	15	.	.
Leather and Leather Goods	.	.	.	.	.	.	.	2	1	.
Clothing, Boots, etc.	1	10	2	.	4	2	2	60	5	9
Bread, Biscuits, etc.	.	3	1	.	.	1	.	17	1	.
Grain Milling	.	.	.	.	.	.	.	2	.	.
Cocoa, Chocolate, etc.	1	2	1	.	.	2	.	56	.	.
Other Food, Drink, Tobacco	1	3	3	1	2	5	.	51	3	20
Furniture, etc.	.	1	1	.	.	.	.	7	2	.
Other Woodworking, etc.	.	.	.	.	.	.	.	1	.	.
Cardboard Boxes, etc.	1	3	.	.	.	.	.	13	.	35
Printing, Publishing, etc.	1	5	2	.	.	.	.	17	2	1
Other Paper, Printing, etc.	.	1	.	.	.	.	.	3	.	.
Building and Decorating	.	1	1	.	.	1	.	4	2	.
Public Works Contracting	.	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	1	1	2	.	.	.	.	13	.	.
Gas, Water, Electricity	.	2	.	.	.	1	.	6	.	5
Railway Service	1	.	.	.	.	.	.	6	.	.
Tram and Bus Service	.	.	.	.	.	.	.	1	.	.
Road Transport (P. & G.)	.	.	2	.	.	.	.	5	1	.
Shipping Service	2	2	2	1	.	.	.	8	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	28	66	22	10	21	14	2	539	51	91
Commerce, Banking, etc.	2	1	1	.	.	.	.	12	.	.
National Government	.	4	1	.	1	.	.	14	2	1
Local Government	2	1	.	1	2	.	.	28	.	.
Professional Services	10	13	6	.	2	2	1	88	14	10
Entertainment, etc.	2	1	3	1	3	1	.	33	3	11
Hotels, etc.	20	44	6	2	8	4	1	252	29	10
Laundry and Dry Cleaning	4	7	3	1	.	1	1	55	2	.
Other Miscellaneous Trades, etc.	3	1	.	.	.	.	.	19	8	1
Agricultural	.	.	.	.	.	.	.	.	2	.
GRAND TOTALS	87	182	78	18	47	38	12	1,415	131	202

TABLE H. Insured Women 16–20, Bristol Area, July 1938: By Industries, All Women (inclusive and exclusive of foreign bulk exchange); Migrant Women and their geographical origin; and special categories

INDUSTRY	Bristol (a)	Bristol (b)	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs, Warwick, Worcester	Rest of Midlands
	All Bristol		MIGRANTS								
			South-Western				Wales			Midlands	
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	1	1	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	4	4	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	1	1	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	148	148	1	.	.	.	.	.	.	1	.
Glass	4	4	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	368	368	1	3	.	1	.	.	.	1	.
Brass, Zinc, etc. Mnfg.	20	20	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	1	1	.	.	.	.	.	.	.	.	.
General Engineering	70	70	.	2	.	.	.	.	.	.	.
Other Engineering	6	6	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	287	282	6	2	3	.	2	.	.	1	1
Other Vehicle Construction, etc.	14	14	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	6	6	.	.	.	.	.	.	.	.	.
Other Metal Industries	217	217	.	1	.	.	.	2	.	2	.
Textiles	155	155	1	2	1	.	.	.	.	.	.
Leather and Leather Goods	40	40	3	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	1,421	1,419	7	6	.	.	.	.	.	2	.
Bread, Biscuits, etc.	211	211	1	3	.	.	.	.	.	1	.
Grain Milling	79	79	1	.	.	.	.	.	.	1	.
Cocoa, Chocolate, etc.	599	599	28	11	2	1	.	1	.	1	.
Other Food, Drink, Tobacco	2,149	2,126	3	2	.	1	1	1	.	1	1
Furniture, etc.	174	174	1	2	.	.	.	.	.	1	.
Other Woodworking, etc.	155	155	.	1	.	.	.	.	.	1	.
Cardboard Boxes, etc.	2,006	1,992	9	2	.	.	.	.	.	1	.
Printing, Publishing, etc.	578	578	1	3	1	1	1	.	.	1	.
Other Paper, Printing, etc.	262	262	.	1	1	.	.	.	.	.	.
Building and Decorating	21	21	.	2	.	.	.	.	.	.	.
Public Works Contracting	1	1	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	236	236	.	2	.	.	.	.	.	.	.
Gas, Water, Electricity	56	54	3	4	.	.	.	.	.	.	.
Railway Service	62	62	.	3	.	.	.	.	.	.	.
Tram and Bus Service	17	17	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	16	16	.	.	1	.	.	.	.	.	.
Shipping Service	11	11	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	5	5	.	.	.	.	.	.	.	.	.
Other Transport, etc.	5	5	.	.	.	.	.	.	.	.	.
Distributive Trades	3,002	2,975	29	74	21	5	25	12	1	10	8
Commerce, Banking, etc.	84	84	1	.	.	.	.	.	.	.	.
National Government	69	69	3	3	.	.	.	.	.	.	.
Local Government	173	173	3	2	.	.	1	.	.	.	.
Professional Services	302	300	1	5	.	.	.	2	1	.	.
Entertainment, etc.	150	144	.	1	1	1	.	.	.	1	.
Hotels, etc.	468	465	2	13	7	1	6	8	4	1	.
Laundry and Dry Cleaning	697	697	2	6	3	13	1	1	.	1	.
Other Miscellaneous Trades, etc.	298	295	.	2	1	.	.	.	.	.	.
Agricultural	12	12	.	.	.	.	.	.	.	.	.
GRAND TOTALS	14,661	14,574	107	158	42	24	37	27	6	28	10

Note: Bristol (a) = Inclusive of foreign Bulk Exchange.
Bristol (b) = Exclusive of foreign Bulk Exchange.

INDUSTRY	MIGRANTS								Special categories	
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	'Bulk Exchange'
Fishing	·	·	·	·	·	·	·	·	·	·
Mining	·	·	·	·	·	·	·	·	·	·
Non-metalliferous M.P.	·	·	·	·	·	·	·	·	·	·
Bricks, etc. Making	·	·	·	·	·	·	·	·	·	·
Pottery, Earthenware, etc.	·	·	·	·	·	·	·	2	·	·
Glass	·	·	·	·	·	·	·	·	·	·
Chemicals, Paints, Oils, etc.	·	1	·	·	·	1	·	8	·	·
Brass, Zinc, etc. Mnfg.	·	·	·	·	·	·	·	·	1	·
Other Metal Manufacture	·	·	·	·	·	·	·	·	·	·
General Engineering	·	1	·	·	·	·	\	3	·	·
Other Engineering	·	·	·	·	·	·	·	·	·	·
Motors, Cycles, Aircraft	1	3	1	·	1	1	·	22	·	5
Other Vehicle Construction, etc.	·	·	·	·	·	·	·	·	·	·
Shipbuilding and Ship Repairing	·	·	·	·	·	·	·	·	·	·
Other Metal Industries	·	·	·	·	·	·	·	5	·	·
Textiles	·	·	1	·	·	·	·	5	·	·
Leather and Leather Goods	·	·	·	·	·	·	·	3	·	·
Clothing, Boots, etc.	·	1	2	·	·	1	·	·19	1	2
Bread, Biscuits, etc.	·	·	·	·	·	·	·	5	1	·
Grain Milling	·	·	·	·	·	·	·	2	·	·
Cocoa, Chocolate, etc.	1	·	2	·	·	·	·	47	·	·
Other Food, Drink, Tobacco	·	3	·	1	1	·	·	15	2	23
Furniture, etc.	·	·	·	·	·	·	·	4	2	·
Other Woodworking, etc.	·	·	·	·	·	·	·	2	·	·
Cardboard Boxes, etc.	·	·	·	·	·	·	·	12	·	14
Printing, Publishing, etc.	·	·	1	·	·	·	·	9	·	·
Other Paper, Printing, etc.	·	·	·	·	·	·	·	2	·	·
Building and Decorating	1	·	1	·	·	·	·	4	1	·
Public Works Contracting	·	·	·	·	·	·	·	·	·	·
Other Mnfg. Industries	·	·	1	·	·	·	·	3	·	·
Gas, Water, Electricity	1	1	·	·	·	·	·	9	·	2
Railway Service	·	·	·	·	·	·	·	3	·	·
Tram and Bus Service	·	·	·	·	·	·	·	·	·	·
Road Transport (P. & G.)	·	·	·	·	·	·	·	1	·	·
Shipping Service	·	·	·	·	·	·	·	·	·	·
Docks and Harbour, etc.	·	·	·	·	·	·	·	·	·	·
Other Transport, etc.	·	·	·	·	·	·	·	·	·	·
Distributive Trades	11	8	4	5	6	2	1	222	18	27
Commerce, Banking, etc.	·	·	·	·	·	·	·	1	·	·
National Government	·	·	1	·	·	·	·	7	·	·
Local Government	·	·	·	·	·	·	·	6	1	·
Professional Services	2	1	·	·	·	·	·	12	·	2
Entertainment, etc.	2	·	2	·	·	·	·	8	·	6
Hotels, etc.	2	4	·	2	·	·	1	51	5	3
Laundry and Dry Cleaning	·	1	2	1	·	·	·	31	·	·
Other Miscellaneous Trades, etc.	1	·	·	·	1	·	·	5	10	3
Agricultural	·	·	·	·	·	·	·	·	·	·
GRAND TOTALS	22	24	18	9	9	5	2	528	42	·87

TABLE I. Insured Girls 14–15, Bristol Area, July 1938: By Industries, All Girls (inclusive and exclusive of foreign bulk exchange); Migrant Girls and their geographical origin; and special categories

INDUSTRY	All Bristol		MIGRANTS								
			South-Western				Wales			Midlands	
	Bristol (a)	Bristol (b)	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.	.
Mining	1	1	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	4	4	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	76	76	2	.	.	.	1	.	.	.	.
Glass	.	.	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	152	152	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.	.	.
General Engineering	19	19	.	.	.	.	.	.	.	.	.
Other Engineering	2	2	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	71	70	3	.	.	.	1	.	.	.	.
Other Vehicle Construction, etc.	11	11	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	62	62	2	.	.	.	.	.	.	.	.
Textiles	39	39	.	1	.	.	.	.	.	.	.
Leather and Leather Goods	15	15	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	578	578	3	2	.	.	1	1	1	.	1
Bread, Biscuits, etc.	70	70	2	.	.	.	1	1	.	.	.
Grain Milling	16	16	.	.	.	.	.	.	.	.	.
Cocoa, Chocolate, etc.	108	108	29	4	3	.	.	.	.	.	.
Other Food, Drink, Tobacco	757	756	.	.	.	1	.	.	.	.	.
Furniture, etc.	80	80	2	.	.	.	.	.	.	.	.
Other Woodworking, etc.	19	19	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	757	747	10	.	.	.	.	.	.	.	.
Printing, Publishing, etc.	351	351	.	.	.	.	.	.	.	1	.
Other Paper, Printing, etc.	83	83	.	.	.	.	.	.	.	.	.
Building and Decorating	8	8	.	.	.	.	.	.	.	.	.
Public Works Contracting	.	.	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	78	78	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	3	3	.	.	.	.	.	.	.	.	.
Railway Service	5	5	.	.	.	.	.	.	.	.	.
Tram and Bus Service	4	4	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	4	4	.	.	.	.	.	.	.	.	.
Shipping Service	1	1	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	838	832	6	7	3	.	3	2	2	3	1
Commerce, Banking, etc.	17	17	.	.	.	.	.	.	.	.	.
National Government	15	15	.	1	.	.	.	.	.	.	.
Local Government	52	52	.	1	.	.	1	.	.	.	.
Professional Services	59	57	.	2	.	2	1	3	.	.	.
Entertainment, etc.	22	20	1	.	.	2	.	.	1	.	.
Hotels, etc.	84	83	.	4	.	2	2	.	.	.	.
Laundry and Dry Cleaning	256	256	4	4	5	14	1	.	.	.	.
Other Miscellaneous Trades, etc.	55	53	.	.	.	.	.	.	.	1	.
Agricultural	5	5	.	.	.	.	.	.	.	.	.
GRAND TOTALS	4,777	4,752	64	26	11	21	12	7	4	5	2

Note: Bristol (a) = Inclusive of foreign Bulk Exchange.
Bristol (b) = Exclusive of foreign Bulk Exchange.

INDUSTRY	MIGRANTS								Special categories	
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'	'Bulk Exchange'
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	.	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	3	.	.
Glass	.	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	.	.	.	.	.	.	.	.	1	.
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.	.
General Engineering	.	.	.	.	.	.	.	.	.	.
Other Engineering	.	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	.	.	1	.	.	.	.	5	.	1
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	.	.	1	.	.	.	.	3	.	.
Textiles	.	.	.	.	1	.	.	2	.	.
Leather and Leather Goods	.	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	.	.	.	.	.	.	.	9	.	.
Bread, Biscuits, etc.	1	.	.	.	.	.	.	5	.	.
Grain Milling	.	.	.	.	.	.	.	.	.	.
Cocoa, Chocolate, etc.	.	1	.	.	.	.	.	37	.	.
Other Food, Drink, Tobacco	.	.	.	.	1	.	.	2	.	1
Furniture, etc.	.	.	.	.	.	.	.	2	.	.
Other Woodworking, etc.	.	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	.	.	.	.	.	.	.	10	.	10
Printing, Publishing, etc.	.	.	.	.	.	.	.	1	.	.
Other Paper, Printing, etc.	.	.	.	.	.	.	.	.	1	.
Building and Decorating	.	.	.	.	.	.	.	.	.	.
Public Works Contracting	.	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	.	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	.	.	.	.	.	.	.	.	.	.
Railway Service	.	.	.	.	.	.	.	.	.	.
Tram and Bus Service	.	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	.	.	.	.	.	.	.	.	.	.
Shipping Service	.	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	.	2	.	.	1	.	.	30	5	6
Commerce, Banking, etc.	.	.	.	.	.	.	.	.	.	.
National Government	.	.	.	.	.	.	.	1	.	.
Local Government	.	.	.	.	.	.	.	2	.	.
Professional Services	.	.	.	.	.	.	.	8	1	2
Entertainment, etc.	.	.	.	.	.	.	.	4	.	2
Hotels, etc.	.	1	.	.	.	.	.	9	.	1
Laundry and Dry Cleaning	.	.	.	.	.	.	.	28	.	.
Other Miscellaneous Trades, etc.	.	.	.	.	.	.	.	1	2	2
Agricultural	.	.	.	.	.	.	.	.	.	.
GRAND TOTALS	1	4	2	.	3	.	.	162	10	25

TABLE J.   Insured Women 21–64, Unemployed, Bristol Area: By Industries,
All Women (18th July 1938); Migrant Women (3rd July) and their
geographical origin; and special category

INDUSTRY	Bristol	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants, Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
	All Bristol	MIGRANTS — South-Western				Wales			Midlands	
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	1	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	1	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	9	.	.	.	.	.	.	.	.	.
Glass	1	.	.	.	.	.	.	.	1	.
Chemicals, Paints, Oils, etc.	25	1	1	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	1	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.	.
General Engineering	5	.	1	.	.	.	.	.	.	.
Other Engineering	2	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	13	.	.	.	.	.	.	.	2	.
Other Vehicle Construction, etc.	1	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	7	.	.	.	.	.	.	.	2	.
Textiles	32	1	1	.	.	.	.	.	.	.
Leather and Leather Goods	10	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	443	2	1	.	.	.	.	.	1	1
Bread, Biscuits, etc.	8	.	.	.	.	.	.	1	2	.
Grain Milling	1	.	.	.	.	.	.	.	.	.
Cocoa, Chocolate, etc.	160	4	.	1	.	.	.	.	1	.
Other Food, Drink, Tobacco	78	1	2	1	.	.	.	.	1	.
Furniture, etc.	7	.	.	.	.	.	.	.	.	.
Other Woodworking, etc.	26	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	41	.	.	.	.	.	.	.	1	.
Printing, Publishing, etc.	22	.	.	.	.	1	.	.	1	.
Other Paper, Printing, etc.	9	1	.	.	.	.	.	.	.	.
Building and Decorating	.	.	.	.	.	.	.	.	.	.
Public Works Contracting	.	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	18	.	1	1	.	.	.	.	.	.
Gas, Water, Electricity	.	.	.	.	.	.	.	.	.	.
Railway Service	2	.	.	.	.	.	.	.	.	.
Tram and Bus Service	3	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	1	.	.	.	.	1	.	.	.	.
Shipping Service	2	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	229	2	11	4	5	3	1	.	2	3
Commerce, Banking, etc.	4	.	.	.	.	2	.	.	1	.
National Government	7	.	.	.	.	.	.	.	.	.
Local Government	13	.	1	2	.	.	.	.	.	.
Professional Services	24	.	3	1	1	1	.	.	.	.
Entertainment, etc.	42	.	.	.	.	.	.	.	2	.
Hotels, etc.	153	.	14	5	8	6	4	.	1	2
Laundry and Dry Cleaning	47	.	1	1	.	.	1	.	1	.
Other Miscellaneous Trades, etc.	3	.	1	.	1	.	.	.	.	1
Agricultural	5	.	.	.	.	.	.	.	.	.
GRAND TOTALS	1,456	12	38	16	15	14	6	1	19	7

INDUSTRY	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton' (Special category)
Fishing	·	·	·	·	·	·	·	·	·
Mining	·	·	·	·	·	·	·	·	·
Non-metalliferous M.P.	·	·	·	·	·	·	·	·	·
Bricks, etc. Making	·	·	·	·	·	·	·	·	·
Pottery, Earthenware, etc.	·	·	·	·	·	·	·	·	·
Glass	·	·	·	·	·	·	·	1	·
Chemicals, Paints, Oils, etc.	·	1	1	·	·	·	·	4	·
Brass, Zinc, etc. Mnfg.	·	·	·	·	·	·	·	·	·
Other Metal Manufacture	·	·	·	·	·	·	·	·	·
General Engineering	·	1	1	·	·	·	·	3	·
Other Engineering	·	·	·	·	·	·	·	·	·
Motors, Cycles, Aircraft	·	·	·	·	·	·	·	2	·
Other Vehicle Construction, etc.	·	·	·	·	·	·	·	·	·
Shipbuilding and Ship Repairing	·	·	·	·	·	·	·	·	·
Other Metal Industries	·	1	2	·	·	·	·	5	·
Textiles	·	1	6	·	2	·	4	15	·
Leather and Leather Goods	·	·	·	·	·	·	·	·	·
Clothing, Boots, etc.	1	4	1	·	1	2	2	16	1
Bread, Biscuits, etc.	·	1	·	·	·	·	·	4	·
Grain Milling	·	·	·	·	·	·	·	·	·
Cocoa, Chocolate, etc.	1	·	·	·	·	·	·	7	·
Other Food, Drink, Tobacco	·	1	·	·	1	1	·	8	·
Furniture, etc.	·	·	1	·	·	·	·	1	1
Other Woodworking, etc.	·	·	·	·	·	·	·	·	·
Cardboard Boxes, etc.	·	1	·	·	·	·	·	2	·
Printing, Publishing, etc.	·	3	·	·	·	·	·	5	·
Other Paper, Printing, etc.	·	·	·	·	·	·	·	1	·
Building and Decorating	·	·	·	·	·	·	·	·	·
Public Works Contracting	·	·	·	·	·	·	·	·	·
Other Mnfg. Industries	·	·	1	·	·	·	·	3	·
Gas, Water, Electricity	·	·	·	·	·	·	·	·	·
Railway Service	·	·	·	·	·	·	·	·	·
Tram and Bus Service	·	·	·	·	·	·	·	·	·
Road Transport (P. & G.)	·	·	·	·	·	·	·	1	·
Shipping Service	·	·	1	·	·	·	·	1	·
Docks and Harbour, etc.	·	·	·	·	·	·	·	·	·
Other Transport, etc.	·	·	·	·	·	·	·	·	·
Distributive Trades	3	17	4	1	2	3	2	63	3
Commerce, Banking, etc.	·	·	·	·	·	·	·	3	·
National Government	·	2	·	·	·	·	·	2	·
Local Government	·	·	·	·	·	·	·	3	·
Professional Services	1	1	·	·	1	·	·	9	·
Entertainment, etc.	1	1	1	1	·	·	·	6	·
Hotels, etc.	2	13	1	1	1	1	·	59	4
Laundry and Dry Cleaning	·	1	·	·	·	·	1	6	·
Other Miscellaneous Trades, etc.	·	·	·	·	·	·	·	3	1
Agricultural	·	·	·	·	·	·	·	·	·
GRAND TOTALS	9	49	20	3	8	7	9	233	10

TABLE K.　Insured Women 16–20, Unemployed, Bristol Area: By Industries, All Women (18th July 1938); Migrant Women (3rd July) and their geographical origin; and special category

INDUSTRY	All Bristol	MIGRANTS								
		South-Western				Wales			Midlands	
	Bristol	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing										
Mining										
Non-metalliferous M.P.										
Bricks, etc. Making										
Pottery, Earthenware, etc.	2								1	1
Glass										
Chemicals, Paints, Oils, etc.	18									
Brass, Zinc, etc. Mnfg.										
Other Metal Manufacture										
General Engineering										
Other Engineering	1									
Motors, Cycles, Aircraft	4			1						
Other Vehicle Construction, etc.										
Shipbuilding and Ship Repairing										
Other Metal Industries	6								2	
Textiles	4			1						
Leather and Leather Goods										
Clothing, Boots, etc.	123	1	1							
Bread, Biscuits, etc.	5		1							
Grain Milling	2									
Cocoa, Chocolate, etc.	77	2		1						
Other Food, Drink, Tobacco	8									1
Furniture, etc.	1									
Other Woodworking, etc.	2									
Cardboard Boxes, etc.	9	1							1	
Printing, Publishing, etc.	8		1		1					
Other Paper, Printing, etc.	6		1							
Building and Decorating										
Public Works Contracting										
Other Mnfg. Industries	2		1							
Gas, Water, Electricity										
Railway Service										
Tram and Bus Service										
Road Transport (P. & G.)										
Shipping Service										
Docks and Harbour, etc.										
Other Transport, etc.										
Distributive Trades	78	1	4	1	1	3	1		1	1
Commerce, Banking, etc.	1									
National Government										
Local Government	5	1								
Professional Services	6									
Entertainment, etc.	8			1					1	
Hotels, etc.	20	1	2	2		1	1			
Laundry and Dry Cleaning	6				1					
Other Miscellaneous Trades, etc.	4									
Agricultural										
GRAND TOTALS	406	7	11	7	3	4	2		6	2

INDUSTRY	MIGRANTS								Special category
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'
Fishing	·	·	·	·	·	·	·	·	·
Mining	·	·	·	·	·	·	·	·	·
Non-metalliferous M.P.	·	·	·	·	·	·	·	·	·
Bricks, etc. Making	·	·	·	·	·	·	·	·	·
Pottery, Earthenware, etc.	·	·	·	·	·	·	·	1	·
Glass	·	·	·	·	·	·	·	·	·
Chemicals, Paints, Oils, etc.	·	·	·	·	·	·	·	·	·
Brass, Zinc, etc. Mnfg.	·	·	·	·	·	·	·	·	·
Other Metal Manufacture	·	·	·	·	·	·	·	·	·
General Engineering	·	·	·	·	·	·	·	·	·
Other Engineering	·	·	·	·	·	·	·	·	·
Motors, Cycles, Aircraft	·	1	·	·	·	·	·	2	·
Other Vehicle Construction, etc.	·	·	·	·	·	·	·	·	·
Shipbuilding and Ship Repairing	·	·	·	·	·	·	·	·	·
Other Metal Industries	·	·	·	·	·	·	·	2	·
Textiles	·	·	·	·	·	·	·	1	·
Leather and Leather Goods	·	·	·	·	·	·	·	·	·
Clothing, Boots, etc.	·	·	2	·	·	·	·	4	·
Bread, Biscuits, etc.	·	·	·	·	·	·	·	1	1
Grain Milling	·	·	·	·	·	·	·	·	·
Cocoa, Chocolate, etc.	1	·	1	·	·	·	·	5	·
Other Food, Drink, Tobacco	·	1	·	·	1	·	·	3	·
Furniture, etc.	·	·	·	·	·	·	·	·	·
Other Woodworking, etc.	·	·	·	·	·	·	·	·	·
Cardboard Boxes, etc.	·	·	·	·	·	·	·	2	·
Printing, Publishing, etc.	·	·	·	·	·	·	·	2	·
Other Paper, Printing, etc.	·	·	·	·	·	·	·	1	·
Building and Decorating	·	·	·	·	·	·	·	·	·
Public Works Contracting	·	·	·	·	·	·	·	·	·
Other Mnfg. Industries	·	·	·	·	·	·	·	1	·
Gas, Water, Electricity	1	·	·	·	·	·	·	1	·
Railway Service	·	·	·	·	·	·	·	·	·
Tram and Bus Service	·	·	·	·	·	·	·	·	·
Road Transport (P. & G.)	·	·	·	·	·	·	·	·	·
Shipping Service	·	·	·	·	·	·	·	·	·
Docks and Harbour, etc.	·	·	·	·	·	·	·	·	·
Other Transport, etc.	·	·	·	·	·	·	·	·	·
Distributive Trades	1	1	·	3	·	1	·	19	3
Commerce, Banking, etc.	·	·	·	·	·	·	·	·	·
National Government	·	·	·	·	·	·	·	·	·
Local Government	·	·	·	·	·	·	·	1	·
Professional Services	1	·	·	·	·	·	·	1	·
Entertainment, etc.	·	·	·	·	·	·	·	2	·
Hotels, etc.	1	1	·	·	·	·	1	10	1
Laundry and Dry Cleaning	·	1	·	·	·	·	·	2	·
Other Miscellaneous Trades, etc.	·	·	·	·	·	·	·	·	1
Agricultural	·	·	·	·	·	·	·	1	·
GRAND TOTALS	5	5	3	3	1	1	1	61	6

TABLE L.   Insured Girls 14–15, Unemployed, Bristol Area: By Industries, All Girls (18th July 1938); Migrant Girls (3rd July) and their geographical origin; and special category

| INDUSTRY | All Bristol | MIGRANTS | | | | | | | | |
| | | South-Western | | | | Wales | | | Midlands | |
	Bristol	Fringe	Rest of Gloucester, Somerset, Wilts.	Cornwall, Devon, Dorset	Hants., Oxford	Glamorgan	Monmouth	Rest of Wales	Staffs., Warwick, Worcester	Rest of Midlands
Fishing	.	.	.	.	.	.	.	.	.	.
Mining	.	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	.	.	.
Glass	.	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	6	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.	.
General Engineering	.	.	.	.	.	.	.	.	.	.
Other Engineering	.	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	.	1	.	.	.	.	.	.	.	.
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing	.	.	.	.	.	.	.	.	.	.
Other Metal Industries	5	.	.	.	.	.	.	.	.	.
Textiles	3	.	1	.	.	.	.	.	.	.
Leather and Leather Goods	.	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	5	.	1	.	.	.	.	.	.	.
Bread, Biscuits, etc.	.	.	.	.	.	.	.	.	.	.
Grain Milling	.	.	.	.	.	.	.	.	.	.
Cocoa, Chocolate, etc.	2	.	.	.	.	.	.	.	.	.
Other Food, Drink, Tobacco	1	.	.	.	.	.	.	.	.	.
Furniture, etc.	1	.	.	.	.	.	.	.	.	.
Other Woodworking, etc.	.	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	1	1	.	.	.	.	.	.	.	.
Printing, Publishing, etc.	3	.	.	.	.	.	.	.	1	.
Other Paper, Printing, etc.	1	.	.	.	.	.	.	.	.	.
Building and Decorating	.	.	.	.	.	.	.	.	.	.
Public Works Contracting	.	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	.	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	.	.	.	.	.	.	.	.	.	.
Railway Service	.	.	.	.	.	.	.	.	.	.
Tram and Bus Service	.	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	.	.	.	.	.	.	.	.	.	.
Shipping Service	.	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.	.
Distributive Trades	9	.	.	.	.	.	1	1	1	1
Commerce, Banking, etc.	.	.	.	.	.	.	.	.	.	.
National Government	.	.	.	.	.	.	.	.	.	.
Local Government	1	.	.	.	.	.	.	.	.	.
Professional Services	2	.	.	.	2	.	.	.	.	.
Entertainment, etc.	1	.	.	.	2	.	.	1	.	.
Hotels, etc.	3	.	.	.	.	.	.	.	.	.
Laundry and Dry Cleaning	4	.	.	.	.	.	.	.	.	.
Other Miscellaneous Trades, etc.	.	.	.	.	.	.	.	.	.	.
Agricultural	.	.	.	.	.	.	.	.	.	.
GRAND TOTALS	48	2	2	.	4	.	1	2	2	1

INDUSTRY	MIGRANTS								Special category
	South-Eastern	London	North-Western	Northern	North-Eastern	Scotland	Northern Ireland	TOTAL	'Clifton'
Fishing	.	.	.	.	.	.	.	.	.
Mining	.	.	.	.	.	.	.	.	.
Non-metalliferous M.P.	.	.	.	.	.	.	.	.	.
Bricks, etc. Making	.	.	.	.	.	.	.	.	.
Pottery, Earthenware, etc.	.	.	.	.	.	.	.	.	.
Glass	.	.	.	.	.	.	.	.	.
Chemicals, Paints, Oils, etc.	.	.	.	.	.	.	.	.	.
Brass, Zinc, etc. Mnfg.	.	.	.	.	.	.	.	.	.
Other Metal Manufacture	.	.	.	.	.	.	.	.	.
General Engineering	.	.	.	.	.	.	.	.	.
Other Engineering	.	.	.	.	.	.	.	.	.
Motors, Cycles, Aircraft	.	.	.	.	.	.	.	1	.
Other Vehicle Construction, etc.	.	.	.	.	.	.	.	.	.
Shipbuilding and Ship Repairing									
Other Metal Industries	.	.	.	.	.	.	.	.	.
Textiles	.	.	.	.	.	.	.	1	.
Leather and Leather Goods	.	.	.	.	.	.	.	.	.
Clothing, Boots, etc.	.	.	.	.	.	.	.	1	.
Bread, Biscuits, etc.	.	.	.	.	.	.	.	.	.
Grain Milling	.	.	.	.	.	.	.	.	.
Cocoa, Chocolate, etc.	.	1	.	.	.	.	.	1	.
Other Food, Drink, Tobacco	.	.	.	.	.	.	.	.	.
Furniture, etc.	.	.	.	.	.	.	.	.	.
Other Woodworking, etc.	.	.	.	.	.	.	.	.	.
Cardboard Boxes, etc.	.	.	.	.	.	.	.	1	.
Printing, Publishing, etc.	.	.	.	.	.	.	.	1	.
Other Paper, Printing, etc.	.	.	.	.	.	.	.	.	.
Building and Decorating	.	.	.	.	.	.	.	.	.
Public Works Contracting	.	.	.	.	.	.	.	.	.
Other Mnfg. Industries	.	.	.	.	.	.	.	.	.
Gas, Water, Electricity	.	.	.	.	.	.	.	.	.
Railway Service	.	.	.	.	.	.	.	.	.
Tram and Bus Service	.	.	.	.	.	.	.	.	.
Road Transport (P. & G.)	.	.	.	.	.	.	.	.	.
Shipping Service	.	.	.	.	.	.	.	.	.
Docks and Harbour, etc.	.	.	.	.	.	.	.	.	.
Other Transport, etc.	.	.	.	.	.	.	.	.	.
Distributive Trades	.	.	.	.	.	.	.	4	1
Commerce, Banking, etc.	.	.	.	.	.	.	.	.	.
National Government	.	.	.	.	.	.	.	.	.
Local Government	.	.	.	.	.	.	.	.	.
Professional Services	.	.	.	.	.	.	.	2	.
Entertainment, etc.	.	.	.	.	.	.	.	3	.
Hotels, etc.	.	1	.	.	.	.	.	1	.
Laundry and Dry Cleaning	.	.	.	.	.	.	.	.	.
Other Miscellaneous Trades, etc.	.	.	.	.	.	.	.	.	.
Agricultural	.	.	.	.	.	.	.	.	.
GRAND TOTALS	.	2	.	.	.	.	.	16	1

CHAPTER III

SOME ASPECTS OF POPULATION IN BRISTOL

By E. Grebenik

Before the Population Statistics Act of 1938 became law, English vital statistics did not record the ages of mothers to whom children were born. This prevented accurate forecasts of population from being made, and such forecasts as were made were approximations. It was one of the purposes of the 1938 Act to provide more complete statistics in this respect.

In the City of Bristol the Medical Officer of Health has kept particulars of the mother's age for all births notified to him. Such figures have been collected since 1915, but when the Public Health Department moved to its new headquarters a few years ago, some of the older records ceased to be available. For the purposes of this study we chose the year 1932, being the earliest year for which these statistics were available, and 1937, the year in which the University of Bristol Social Survey was taken.

From the birth register we could obtain the mother's age, the parity order of the child and the place where the child was born (i.e. whether it was born in a hospital or similar institution, or at home).

In this paper we shall first of all attempt a forecast of the future population of Bristol, assuming fertility and mortality to remain at their present level. We shall then proceed to an analysis of differential fertility between different occupational groups of the population, our information being taken from the records of Bristol's Health Visitors.

1. *Mortality*

In order to obtain Bristol mortality we have constructed a life-table for the city. We have tried to make it conform as closely as possible to English Life-Table No. 10, published by the Registrar-General. But as the life-table was to be used primarily to obtain estimates of the future population of Bristol, and was not meant to give a meticulously accurate picture of Bristol mortality, complete theoretical accuracy has to some extent been sacrificed for ease of computation. It will be sufficient here to give a short sketch of the method of construction.

In English Life-Table No. 10 the Registrar-General uses the 1931 census population, tabulated in five-yearly age groups. Using a graduation formula, he proceeds to obtain quinquennial pivotal values of the population, to which he applies the deaths, which have previously been graduated in a similar manner. Thus, the central death-rate m_x is obtained. From this q_x, the probability of dying in a given year, may be deduced. A series of q_x's at five-yearly intervals is thus calculated, and the remaining values are filled in by osculatory interpolation. For ages under 22 a different method is used, and for ages higher than 87 a Gompertz graduation is applied.

The Bristol Life-Table is based on the census population of 1931, adjusted
to allow for the interval between the date of the census and the middle of the
year. The average number of deaths occurring in 1930, 1931 and 1932 has
been used, and the method described in the preceding paragraph has been
applied to give a series of q_x for ages 12 to 72.

For ages over 72 we have extrapolated by using a Makeham formula. This
is a very approximate method which exaggerates mortality at late ages. As
the number of aged persons in the population is, however, relatively small,
this will not affect our forecasts very much. The use of this formula will,
however, slightly reduce the values given for the expectation of life. For ages
o to 12 a number of approximate methods has been used, and the life-table
functions have been computed from figures given in the Quarterly Returns
of the Registrar-General.

The Bristol Life-Table compares rather favourably with English Life-Table
No. 10, with which it is strictly comparable for ages 22 to 72. As regards
females, mortality at ages 39 to 55 is worse than for the country as a whole,
whereas at other periods of life it is lower than that of the general population.
In Table 39 we show the ratio of q_x—the probability at birthday x of dying
in that year—in the Bristol Table, to the q_x given in English Life-Table No. 10.
As regards males, this table does not exhibit the same regularity as it does for
females. In the case of adult males vitality in Bristol does not seem to differ
appreciably from that of England and Wales as a whole, whereas the vitality
of women of menopausal and immediate post-menopausal age seems to be
lower in Bristol.

TABLE 39.   Ratio of Bristol q_x to q_x given in English Life-Table No. 10

Age	Males	Females	Age	Males	Females
20	0·97	0·98	50	1·02	1·11
25	1·03	0·96	55	0·96	1·00
30	0 95	0·99	60	0 93	0·91
35	1·05	0·87	65	1·00	0·88
40	0·98	1·10	70	1·01	0·89
45	0·99	1·10			

At other ages the two tables are not strictly comparable, as different methods
have been used in their construction. For ages over 72 mortality in Bristol
would seem to be definitely heavier than in England and Wales, though this
excess may be apparent rather than real, owing to the method of graduation
employed. It should be noted that in spite of the graduation, the national
mortality rate for females exceeds the rate for Bristol females up to age 79.
Male mortality experience in Bristol, however, is definitely worse.

Bristol mortality in youth and adolescence is, on the whole, lower than that
shown in the national table, though females aged 15 to 20 and males aged
2 to 4 experience a mortality very slightly above the national rate. Infantile
mortality in Bristol compared very favourably with mortality in the country
as a whole.

In Table 40 we compare the probability of surviving 10 years at birthday x,
given by the National Table, and by the Bristol Table. This tends to confirm
the impression given by the comparison of the series of q_x. The superiority

of Bristol female mortality experience is clearly shown, and no appreciable difference in male mortality is indicated.

TABLE 40.   Comparison of $_{10}p_x$ in Bristol Life-Table and English Life-Table No. 10

Age	Males		Females	
	Bristol	E L.T. No. 10	Bristol	E.L.T. No. 10
0	0·9051	0·8902	0·9270	0 9108
10	0·9824	0 9800	0 9824	0·9814
20	0·9673	0 9676	0 9720	0·9710
30	0·9581	0·9588	0 9668	0 9642
40	0·9249	0 9241	0·9374	0·9435
50	0·8552	0·8506	0·8887	0·8891
60	0·6834	0·6816	0·7818	0 7570
70	0·3716	0·3736	0·4862	0 4680

The expectation of life at birth in Bristol is 59·82 years for males and 64·14 years for females. These figures compare favourably with the corresponding figures given in English Life-Table No. 10, 58·74 years for males and 62·88 years for females.[1]

The Bristol Table reproduces one of the phenomena commented upon by the Government Actuary in his report on English Life-Table No. 10. The regular progression of the q_x's is interrupted between the ages of 20 and 30. This tendency is actually accentuated in the case of the Bristol Table. For males the maximum q_x occurs at a slightly later age than in English Life-Table No. 10, and the consequent depression is more pronounced. In the case of females there are two such interruptions, both small, between ages 19 and 21 and 33 and 35. No explanation can be given for this phenomenon. The Government Actuary comments on p. 6 of the Registrar-General's Decennial Supplement for 1931, Part I:

'Had this feature obtained only among females there might have been an inclination to assign it to misstatements of age, but the fact that it is more pronounced among males than among females would appear to indicate that some special factor or factors are operating at these ages to disturb the progressive increase in the rate of mortality from age to age.'

2. *Fertility*

In order to compute specific fertility rates we have estimated the 1932 Bristol population by applying the sex-age distribution of the estimated 1931 mid-year population to the Registrar-General's figure of the mid-year 1932 Bristol

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1 It may be of interest to record that there was an attempt to calculate a life-table for Bristol about 100 years ago. In 1830 Robert Rankin, the then Secretary of the Bristol Union Fire and Life Insurance Company, published a book entitled 'A familiar Treatise on Life Assurances and Annuities comprising a historical Sketch of the Science of Life Assurance Offices with Observations on the Duration of Human Life and other Objects of Interest connected with the Subject, to which are appended Original Tables of the Probabilities and Expectations of Life in the City of Bristol'. The table, like most tables of that period, is based solely on burial statistics. Some of the tables are especially interesting, as the author has tried to calculate mortality tables for different sections of the population. Thus the expectation of life at birth for all Bristol inhabitants was 28·78 years, but for members of the Society of Friends it was 40·40 years. It appears that this table has not been previously noticed. It is not mentioned either by Kuczynski or Newsholme, nor does it appear to have been noted in the historical survey of English life-tables published under the auspices of the American Institute of Actuaries.

population. From the birth register we have excluded all births of non-Bristol women, who came to Bristol solely for the purpose of being confined there. This proved possible, as the home address of the mother was shown in the Birth Register. We could not, however, make an allowance for Bristol women who left the city for their confinements, but the number of such women is probably small, as there are excellent maternity hospital facilities available in Bristol itself. In 1932 there were 96 births and in 1937 35 births for which the age of the mother was unknown. These births have been allocated to the different age groups in the same proportion as the births for which the age of the mother was known. In Table 41 the calculation of the various reproduction rates for 1932 is shown.

TABLE 41. Calculation of reproduction rates, Bristol 1932

Age	Estimated female population, 1932	Female live births, 1932	Specific fertility rates	Total births in stationary population
15–19	17,654	71	0·0040	1,833
20–24	18,991	561	0·0295	13,345
25–29	17,978	929	0·0517	23,057
30–34	17,072	705	0·0413	18,135
35–39	16,426	450	0·0274	11,830
40–44	14,938	172	0·0115	4,852
45–49	14,098	6	0·0004	163
All	117,157	2,894	0·1658	73,215

As we are working with five-yearly age groups, the sum of the specific fertility rates must be multiplied by five in order to give us the gross reproduction rate. We thus obtain a gross reproduction rate of $0·1658 \times 5 = 0·829$ and a net reproduction rate of $0·732$. The stationary population in each five-yearly age group has been calculated by the formula $_5L_x = 2\frac{1}{2}(l_x + l_{x+5})$. An attempt to calculate the rates by individual ages led to almost the same result for the gross reproduction rate and to exactly the same result for the net reproduction rate. As it was felt that there might have been some mis-statement of age in the records, the calculation by five-yearly age groups was thought to be the more reliable one.

In order to find the gross reproduction rate necessary to make the net reproduction rate equal to unity—i.e. the rate that would be necessary if the population were just to replace itself—we use the ratio $\dfrac{0·732}{0·829} = \dfrac{1·000}{x}$, where x is the required gross reproduction rate. This is found to be $1·133$. It is thus seen that the gross reproduction rate must rise by 36·7 per cent if the population of Bristol is to replace itself. If fertility in each age group were increased in this proportion, there would be 3,956 female births a year, instead of 2,894 in 1932, an increase of 1,062.

The rates we have computed may be compared with similar rates calculated by Glass[1] both for Bristol and for England and Wales as a whole. The comparisons are set out in Table 42.

[1] Glass, 'Changes in Fertility in England and Wales, 1851–1931', in *Political Arithmetic*, ed. L. Hogben, p. 168. Glass had to use foreign specific fertility rates in his estimates.

TABLE 42.   Comparison of Bristol reproduction rates with Glass's rates

Gross reproduction rate, Bristol, 1932   ..   . .   0·829
Net reproduction rate, Bristol, 1932   ...   .   0·732
Glass's gross reproduction rate, England and Wales, 1930–32 .   .   ...   0·929
Glass's net reproduction rate, England and Wales, 1930–32   ...   .   0 807
Glass's gross reproduction rate, Bristol, 1931[1]   ..   .   .   0·860
Bristol, 1932, gross reproduction rate as percentage of England and Wales gross
    reproduction rate, 1930–32   ..   .   .   89 2
Bristol, 1932, net reproduction rate as percentage of England and Wales net
    reproduction rate, 1930–32   . .   ..   90·7
Bristol, 1932, gross reproduction rate as percentage of Bristol, 1931, gross
    reproduction rate ...   .   96·4

The difference in the ratios of the gross and net reproduction rates reflects the slightly better mortality experience of Bristol females of child-bearing age. This was commented upon in the first section.

In order to compute reproduction rates for 1937, the second year studied, an estimate of the 1937 Bristol population had to be made. This was done by applying 1932 fertility rates and the mortality of the life-table to the 1932 population. The method is described in Appendix 1. The application of this method gave us a population which was smaller than the Registrar-General's estimate for 1937 by 5,882 persons; a difference of the order of 1 per cent, which falls well within the error of the method. We have added to each sex age group of the estimated population that proportion of the 5,882 persons that the population of that group bears to the total population. Table 43 shows the population of Bristol in 1937 estimated in this way.

TABLE 43.   Estimated population of Bristol, 1937

Age	Males	Females	Total
0–4	15,078	14,269	29,347
5–9	14,344	13,971	28,315
10–14	16,673	16,182	32,855
15–19	15,869	15,713	31,582
20–24	16,441	17,682	34,123
25–29	16,630	18,992	35,622
30–34	15,851	17,955	33,806
35–39	13,857	17,027	30,884
40–44	13,039	16,282	29,321
45–49	12,055	14,671	26,726
50–54	11,179	13,686	24,865
55–59	10,429	12,927	23,356
60–64	8,897	10,470	19,367
65–69	6,427	8,211	14,638
70–74	4,251	6,178	10,429
75–79	2,216	3,854	6,070
80–84	978	1,835	2,813
85–89	279	565	844
90–94	42	95	137
All	194,535	220,565	415,100

Births to non-Bristol women were again excluded and gross and net reproduction rates for 1937 were then calculated as shown in Table 44.

[1] Political Arithmetic, ed. L. Hogben. p. 183.

TABLE 44.   Calculation of reproduction rates, Bristol, 1937

Age	Estimated female popu-lation, 1937	Female live births, 1937	Specific fertility rate	Total births in stationary population
15–19	15,713	87	0 0055	2,520
20–24	17,682	652	0·0369	16,692
25–29	18,992	930	0·0490	21,853
30–34	17,955	707	0 0394	17,300
35–39	17,027	355	0·0208	8,980
40–44	16,282	125	0·0077	3,249
45–49	14,671	23	0 0016	654
All	118,322	2,879	0·1609	71,248

The gross reproduction rate for 1937 is 0·805 and the net reproduction rate is 0·712. In the five years 1932–37 the gross reproduction rate has thus fallen by 2·9 per cent and the net reproduction rate by 2·7 per cent. But this decline in fertility is by no means evenly distributed over the different age groups. Changes in specific fertility rates are shown in Table 45. Of these changes

TABLE 45.   Changes in specific fertility rates, 1932–37

Age of mother	S.F.R., 1932	S.F.R., 1937	Per cent change
15–19	0·0040	0·0055	+ 37 5
20–24	0·0295	0·0369	+ 25·1
25–29	0 0517	0·0490	− 5·2
30–34	0 0413	0·0394	− 4·6
35–39	0 0274	0·0208	− 24 1
40–44	0 0115	0·0077	− 33·0
45–49	0 0004	0·0016	+300·0

we may dismiss the very large increase in the age group 45–49 as due to chance fluctuations of the very small numbers involved. The age group 15–19 is known to have fluctuating specific fertility rates, but the 25 per cent increase in the age group 20–24 merits consideration. In a later section we shall show that the proportion of first-born children is significantly higher in 1937 than in 1932. But this may be due to a sudden increase in the number of marriages. We have accordingly extracted the number of marriages in Bristol from 1929 to 1937 from the *Annual Reports of the Medical Officer of Health for Bristol.* These are shown in Table 46.

TABLE 46.   Number of marriages in Bristol, 1929–37

1929	3,197	1932	3,098	1935	3,558
1930	3,320	1933	3,183	1936	3,805
1931	3,287	1934	3,435	1937	3,781

Whilst the number of marriages registered or solemnized in Bristol does not, of course, account completely for births in the next year, or even for first births, it is probable that an increase in marriages will later be reflected by an increase in births. Table 46 shows that there was a peak in marriages in 1936. According to the *Registrar-General's Statistical Review* for 1936, 44·5 per cent of all women marrying in England and Wales in that year were aged 24 or less. If we assume a similar percentage for Bristol, and if we further suppose one half of these 44·5 per cent to have their first child within a year or so of marriage, then there would be 740 such births in 1932 and

856 in 1937, an increase of 15·7 per cent in specific fertility rates, if the female population had remained stationary. In fact the population aged 15 to 24 was 36,645 in 1932 and 33,395 in 1937, so that the proportional increase in specific fertility rates would be even larger. These calculations are meant to show that it is possible that a large part of the increase in specific fertility rates may be accounted for by the 1936 marriage peak. Without entering into the vexed controversy whether the birth-rate is or is not affected by economic conditions, it may safely be suggested that 1937 was a more suitable year in which to have a child than 1932. Children born in the latter year would have been conceived in the beginning of the slump, when economic insecurity was very pronounced. All this suggests that the rise in specific fertility rates at ages 15 to 24 may not be wholly unconnected with economic revival. It would certainly be unsafe to regard it as a permanent rise of fertility at these ages without adducing much additional evidence.

The rest of the specific fertility rates in 1937 show decreases as compared with 1932, and the decrease seems to be getting larger with advancing age. This aspect of the problem will be dealt with more conveniently in a later section where age and parity are compared.

It remains to deal with relative fertility at various ages. For this problem all births have to be considered, and Table 47 gives a comprehensive picture.

TABLE 47.   Relative fertility at various ages

Age of mother	Live births, 1932	Live births, 1937	1932, per cent	1937, per cent	15–19 = 100	
					1932	1937
15–19	153	171	2·60	2·88	100	100
20–24	1,190	1,368	20·20	23·07	778	800
25–29	1,874	1,928	31·81	32·51	1,225	1,127
30–34	1,436	1,454	24·38	24·52	939	850
35–39	881	718	14·95	12·11	576	420
40–44	335	252	5·69	4·25	219	147
45–49	22	39	0·37	0·66	14	23

It is easily seen that both in 1932 and in 1937 over 50 per cent of all births are accounted for by women between the ages of 20 and 30 and over 75 per cent of all births by women between the ages of 20 and 35. More detailed statistics show that the specific fertility rate declines sharply at age 32 or 33.

In computing reproduction rates we have used female births only instead of computing total specific fertility rates by using all births, whose sum would then be multiplied by the sex ratio at birth. Our figures appear to indicate that the sex ratio at birth may differ for different age groups of mothers, and for this reason it seemed desirable to use female births only in the calculations.[1]

3. *Future population*

In Table 48 we show the estimated future population of Bristol and its age distribution, on the assumption that fertility remains at the 1937 level and that mortality is measured by our life-table. The method of estimation is described in detail in Appendix 1. It should be noted that the population

[1] I hope to be able to analyse the figures relating to the sex ratio at birth in greater detail later.

TABLE 48. Estimated future population of Bristol (in 000's)

	Males				Females			
Age	1937	1942	1947	1952	1937	1942	1947	1952
0–4	15·1	14·3	13·7	12·9	14·3	13·7	13 1	12·3
5–9	14·3	14·3	13·6	13·0	14·0	13·7	13·1	12·6
10–14	16·7	14·2	14·2	13·5	16·2	13·9	13·6	13·1
15–19	15·9	16·5	14·1	14·1	15·7	16·0	13·8	13 5
20–24	16 4	15 6	16·3	13·9	17·7	15·5	15·8	13·6
25–29	16·6	16·2	15·4	16·0	19·0	17·4	15·3	15·6
30–34	15·9	16·3	15·9	15·1	18·0	18·7	17·2	15·1
35–39	13·9	15·5	16·0	15·6	17·0	17·7	18·4	16·9
40–44	13·0	13·5	15·1	15·6	16 3	16·6	17·3	18·0
45–49	12·1	12·5	13·0	14·5	14·7	15·8	16·1	16·7
50–54	11·2	11·4	11·9	12·3	13·7	14·0	15·1	15·4
55–59	10·4	10·3	10·5	11·0	12·9	12·9	13·2	14·2
60–64	8 9	9 3	9·2	9·4	10·5	11·9	11·9	12·2
65–69	6·4	7·4	7·7	7·7	8·2	9·3	10·6	10·5
70–74	4·3	4·8	5·5	5·7	6·2	6·7	7·6	8·7
75–79	2·2	2·7	3·0	3·4	3·9	4·4	4·8	5·4
80–84	1·0	1·1	1·3	1·4	1·8	2·1	2·4	2·6
85–89	0·3	0·3	0·3	0·4	0·6	0·6	0·7	0·8
90–94	·		·		0·1	0·1	0·1	0·1
Total	194·5	196·4	196·7	195·5	220·6	221·1	220·0	217·2

aged 72 and over will be slightly under-estimated in these tables, as the life-table tends to exaggerate mortality at age 72 and over. In Table 49 the estimated total population is shown at five-yearly intervals for the next 65 years.

TABLE 49. Estimated total future-population of Bristol (in 000's)

	Males	Females	Total		Males	Females	Total
1937	194·5	220·6	415·1	1972	178·8	192·1	370·9
1942	196·4	221·1	417·5	1977	172·5	183·6	356·1
1947	196·7	220·0	416·7	1982	165·4	174·7	340·1
1952	195·5	217·2	412·7	1987	157 8	165·4	323·2
1957	192·9	212·7	405·6	1992	150·0	156·2	306·2
1962	189·0	206·8	395·8	1997	142·1	147·3	289·4
1967	184·3	199·8	384·1	2002	134·5	138·9	273·4

In Table 50 we give the quinquennial percentage change in the population. The estimated future population is also shown as a percentage of the 1937 population.

TABLE 50. Quinquennial percentage changes in the population

Per cent change			1937 Population = 100		
Period	Males	Females	Year	Males	Females
1937–42	+1·0	+0·2	1937	100·0	100·0
1942–47	+0·2	−0·5	1942	101·0	100·2
1947–52	−0·6	−1·3	1947	101·1	99·7
1952–57	−1·3	−2·1	1952	100·5	98·5
1957–62	−2·0	−2·8	1957	99·2	96·4
1962–67	−2·5	−3·4	1962	97·2	93·7
1967–72	−3·0	−3·9	1967	94·8	90·6
1972–77	−3·5	−4·4	1972	91·9	87·1
1977–82	−4·1	−4·8	1977	88·7	83·2
1982–87	−4·6	−5·3	1982	85·0	79·2
1987–92	−4·9	−5·6	1987	81·1	75·0
1992–97	−5·3	−5·7	1992	77·1	70·8
1997–2002	−5·3	−5·7	1997	73·1	66·8
			2002	69·	63·0

From these tables it is seen that the male population will go on increasing slightly until about 1947, and will then begin decreasing at an increasing rate until the end of the century, when the rate of decrease shows signs of becoming stable. In the case of females the decrease will set in earlier, but again the rate shows signs of stability at the end of the present century.[1] The decline of the female population begins earlier than that of the male because of the different age distributions of the two sexes. Whilst in 1937 48·8 per cent of the male population were under 30, the corresponding proportion among females was only 43·9 per cent. The mortality under 30 being fairly low, the decline begins to show itself earlier among females, a larger proportion of whom is subject to heavier mortality experience.

In Table 51 the estimated population of schoolchildren is shown together with its percentage decreases. The decline in numbers among them is much more rapid than among the population as a whole, because the effects of the low fertility rate are quickest in making themselves felt among the youngest section of the population.

TABLE 51.   Estimated number of schoolchildren in Bristol (aged 5 to 14) and percentage changes

Year	In (000's)		Per cent decrease		1937 Population = 100	
	Males	Females	Males	Females	Males	Females
1937	31·0	30·2	8·1	8·6	100 0	100·0
1942	28·5	27·6	2·5	3·3	91·9	91·4
1947	27·8	26·7	4·7	3·7	89·7	88·4
1952	26·5	25·7	5·3	5·4	85·5	85·1
1957	25·1	24·3	6·4	6·6	81·0	80·5
1962	23·5	22·7	6·4	6·2	75·8	75·2
1967	22·0	21·3	5·9	5·6	71·0	70·5
1972	20·7	20·1	4·8	5·5	66·8	66·6
1977	19 7	19·0	5·1	5·3	63·5	62·9
1982	18 7	18·0	5·3	4·4	60·3	59·6
1987	17·7	17·2	5·6	6·4	57·1	57·0
1992	16·7	16·1	5·6	6·4	53·9	53·3
1997	15·6	15·2	5·1	5·9	50·3	50·3
2002	14·8	14·3	.	.	47·7	47·4

Table 52 shows the changes in the age distribution of the population. We have divided it into four age groups, one of which comprises the population of working age (aged 15 to 64), and into three classes of dependents age 0 to 4,

TABLE 52.   Per cent age distribution of the estimated future population

Year	Males				Females			
	0–4	5–14	15–64	65–	0–4	5–14	15–64	65–
1937	7·8	15·9	69·1	7·3	6·5	13·7	70·5	9·4
1947	7·0	14·1	69·9	9·1	6·0	12·1	70·1	11·9
1957	6·2	13·0	70·8	10·0	5·4	11·4	69·3	13·9
1967	5·8	11·9	71·2	11·0	5·1	10·7	68·1	16·1
1977	5·6	11·4	69·7	13·3	5·0	10·4	65·7	19·0
1987	5·4	11·2	68·7	14·8	4·9	10·4	64·9	19·9
1997	5·4	11·0	68·2	15·5	4·9	10·3	65·1	19·7

1 It should be emphasized that these percentage rates of decrease are only rough approximations. The calculation of the stable population and the corresponding true rates of decrease are left to the next section.

5 to 14, and 65 and over respectively. It is seen that the proportion of the working population does not show any marked decrease, and more especially the male working population remains proportionately almost constant. Thus the fear that the burden of maintaining a declining population will fall on a smaller proportion of the population than is the case to-day is seen to be unfounded.

But, whilst the proportion of the population of working age will remain constant, the position of the different groups in the non-working population is almost wholly reversed. To-day (1937) people aged 65 and over constitute less than 10 per cent of the population and the number of dependent children is nearly three times that of the aged. In 60 years' time, however, the number of dependent children will fall short of the number of aged people. This will, of course, have important effects on social life, and especially on family life. The trend should also be taken into account when the building of schools and health clinics is considered. In Table 51 we showed that the decline in the number of schoolchildren will, in the absence of any net inward migration, set in almost immediately. Expenditure on schools or infant clinics should therefore aim at improving quality rather than quantity.

In this section we have used the indicative mood throughout, but the use of the subjunctive would be much more appropriate. The calculations in this section cannot show what will happen to the future population of Bristol, they do show what is implied in the present level of fertility and mortality as projected into the future. It might be argued that these assumptions are arbitrary and that they do not allow for migration. Let us deal with the second objection first. Mr Shannon, in Chapter II of this volume, 'Migration and the Bristol Area', has shown that the growth of Bristol in the past has been due mainly to natural increase and that inward and outward migration have been almost equal. Moreover, it is difficult to see where the migrants of the future are to come from, as Dr Charles has shown[1] that the experience of the country as a whole will be similar to that of Bristol. And the one conclusion that emerges most clearly from our discussion is that quite a considerable amount of net inward migration will be necessary in order even to maintain the population of Bristol at its present level.[2] As regards the first objection, it is undoubtedly true. It is almost certain that there will be changes both in fertility and mortality. But any attempt to estimate the extent, and indeed even the direction, of these changes must be mere guesswork.

We are therefore left with the conclusion that a decline in the population of Bristol is inevitable. It may be larger or smaller than our figures indicate, but a decline there will be. Again, this will have important effects on the life of Bristol, and the expectation of a declining population should be taken into

1 *The Effect of Present Trends in Fertility and Mortality upon the Future Population of England and Wales and upon its Age Composition*, by Enid Charles, London and Cambridge Economic Service, Special Memorandum No. 40, London, August 1935. Dr Charles's is only one of many similar studies, all pointing towards a substantial decline of the population of this country in the near future.

2 It may be argued that the influx of evacuees into Bristol may lead to some inward migration, as some firms may stay in Bristol after the end of the War. This appears improbable and no reasoned estimate of migration could be made at the present stage, even if the argument were true.

account when new long-term plans are put into effect. Housing and sewage schemes, the provision of parks and open spaces, hospital and maternity facilities, urban transport—all these must take the population factor into account. It would need too much space to go into detail here; a full discussion of the economic consequences of a declining population in the national sphere, to which further reference should be made, has recently been published.[1]

The picture will be rounded off in section 4, which will deal with the stable population and with its corresponding real rate of decrease. Taken in conjunction with the figures of this section, it should give a fairly comprehensive picture of the meaning of present fertility and mortality rates.

4. *The stable population*

In the preceding section we have demonstrated the effects that a continuation of present fertility and mortality rates will have on the Bristol population. These calculations are very laborious, and to carry them farther than we have done would serve no useful purpose. At the same time they do not tell us much about the ultimate fate of the Bristol population.

In order to obtain that knowledge we must make use of the methods first devised by Bortkiewicz and Lotka.[2] They have shown that if a population is subject to constant fertility and mortality it will ultimately settle down to a stable rate of increase or decrease and to a stable age distribution. Both the stable rate of decrease and the stable age distribution may be computed from a knowledge of the net fertility schedule. The method and formulae we have used are given in Appendix 2.

We find that if present fertility and mortality trends continue unchecked, and if there is no net inward migration, the female population of Bristol will ultimately settle down to a stable rate of decrease of 0·01148 or 1·15 per cent per annum. We have shown in Table 50 that the female population as computed by our arithmetical method decreases by 5·7 per cent over the two five-year periods 1992–97 and 1997–2002. This corresponds approximately to the yearly stable rate of decrease computed above. Small oscillations about the stable rate of decrease may take place after 2002, but they will continuously diminish in magnitude. The average age of mothers at confinement will be 29·32 years.

We have also computed the age distribution of the stable female population. It is given in five-yearly age groups in Appendix 2. For our purposes it will be sufficient to give a summary table, comparable with Table 52.

It is easily seen that the age distribution of the estimated 1997 population corresponds nearly to that of the stable population.

What is true of the female population will also hold of the males if the sex ratio at birth is assumed to be constant. The five-yearly decreases of the males show signs of becoming stable at the end of the century, but their stable rate of decrease will probably be slightly lower than that of the females.

1 W. B. Reddaway, *The Economics of a declining Population*, London, 1939.
2 For the most recent statements of the theory see E. C. Rhodes, 'Population Mathematics', chs. v–vi, *Journ. Roy. Stat. Soc.* Part 2, 1940, and Lotka, *Analyse démographique avec application particulière à l'espèce humaine*, pp. 64–71.

TABLE 53. Per cent age distribution of the stable female population compared with that of the estimated 1997 population

Age	Stable population	1997 population
0–4	4·8	4 9
5–14	10 2	10 3
15–64	64 8	65 1
65–	20·2	19 7

To sum up, the effect of an unchecked continuation of present fertility and mortality rates means that in the next 65 years the population of Bristol will, in the absence of net inward migration, decrease from 415,000 to about 273,000, a decrease of about 34 per cent, and will thereafter continue to diminish by about 5½ per cent of itself every 5 years. This rate of decrease roughly corresponds to one-third every 30 years.

5. *Mother's age and parity order*

Before beginning to analyse differential fertility in Bristol we shall have to devote some attention to the relation of the age of the mother to the parity order of the child. The information as to parity order may be obtained from the Birth Register, and theoretically parity should, of course, include any product of conceptions; that is to say, stillbirths and abortions should be counted. When we investigated the Health Visitors' Records[1] which gave the previous pregnancy history of the mother it became clear, however, that the number of admitted abortions was so low that we were forced to the conclusion that there had been some concealment. This factor could not, of course, be taken into account in the tables. The tables in Appendix 3 give us the distribution of live births by age of mother and parity order for each of the years 1932 and 1937. (We have excluded stillbirths because no information regarding them could be gathered from the follow-up study of Health Visitors' Records described below.) The number of children born appears to decline sharply after the mother has reached the age of about 32 or 33, but in neither of the tables is there a sharply defined peak at which the maximum number of births takes place. We have calculated mean parity ages for the mothers, and in Table 54 we show them for the two years studied together with the ratio of their difference to its standard error.

TABLE 54. Average age of mothers for various parities

Live births, Bristol, 1932 and 1937

Parity	1932	1937	Diff./S.E. diff.
1	26·27	26·41	1·08
2	28·84	29·07	1·28
3	31·03	31·04	0·04
4	33·22	32·85	1·12
5	34·83	33·98	2·07
6	35·50	35·79	0·62
7	37·63	37·27	0·65
8	38·09	37·16	1·37
9	38·10	38·78	0·89
10	38·88	40·43	1·91
11–	41·08	41·62	0·98
All	29·87	29·31	5·09

1 See section 6 below.

Regarding a difference that exceeds twice its standard error as significant, there is only one such difference between individual mean parity ages. The average age for all mothers is, however, significantly lower in 1937 than in 1932. This must be due to the changing weights given to individual mean parity ages, or, in other words, to a change in the proportion of children of low parity order. There is also an irregularity in the smooth progression of average ages at parity 8. In 1932 the mean age at eighth confinement is lower by only 0·01 of a year from the mean age at ninth confinement, and in 1937 it is actually lower than the mean age at seventh confinement. These irregularities must be ascribed to chance fluctuations.

In Table 55 we show the proportion of children of various parity orders born in 1932 and 1937, and compare it to two similar distributions, one relating to Stockport in 1937 and the other to Glasgow in 1913.[1]

TABLE 55.   Proportion of children of various parity orders

Parity	Bristol, 1932	Bristol, 1937	Stockport, 1937	Glasgow, 1913
1	37·47	43·13	39·71	14·14
2	24·64	25·32	23·92	16·46
3	12·97	12·59	13·36	14·09
4	7·96	7·28	8·03	11·97
5	5·68	4·19	5·87	11·90
6	3·97	2·36	3·34	9·07
7	2·51	1·75	2·08	7·33
8	1·82	0·98	1·08	5·60
9	1·08	0·68	0·99	4·02
10	0·85	0·68	0·63	2·22
11–	1·05	1·04	0·99	3·20
All	100·00	100·00	100·00	100·00

On testing the 1932 and 1937 Bristol distribution for significant difference by the χ^2 test,[2] we find a χ^2 of 90·26, which for 10 degrees of freedom gives us a P of less than 1 per cent. We thus conclude that the difference between the two distributions cannot be due to random fluctuations, and an inspection of Table 55 will show that there has been a real tendency for the proportion of children of high parity to fall in 1937, as compared with 1932.

In the Stockport sample the authors examined a series of 1,108 pregnant women. There was no selection as to social circumstances or as to parity, the patients being those who attended Stockport Corporation ante-natal clinics. The Stockport results agree fairly well with the Bristol results for the same year. On testing the two distributions by the χ^2 test, we obtain a χ^2 of 15·84, which for 10 degrees of freedom corresponds to a P of about 10 per cent. The two distributions are thus not significantly different. From these two samples it might be concluded that the percentage of first-born children in a 1937 urban population was in the neighbourhood of 40 per cent, and that roughly three-quarters of the children born were either first, second or third children.

1 Reid and Mackintosh, 'The Incidence of Anæmia in Pregnancy', *The Lancet*, vol. 232, 1937, p. 43. Pearson and others, 'On the Correlation of Fertility with Social Value, Section III, Glasgow Data', by H. J. Laski, *Eugenics Laboratory Memoirs*, 1913, No. 18, p. 47.
2 The formula used was that given by Fisher in *Statistical Methods for Research Workers* (7th edition), p. 91.

These results provide a striking contrast to the pre-war situation in Glasgow. The data consisted of 'reports on upwards of 8,000 babies born in Glasgow most kindly provided by Dr Chalmers, the Medical Officer of Health for the City. This material...is not drawn from a special class.' The tables really give the size of the family, which is not quite the same as parity order, but, even so, the discrepancies are striking. It appears from the context of the Glasgow study that the data related to the working class, but if these figures were compared to corresponding ones for Bristol unskilled labourers in 1937, there would still be a large discrepancy. There appears to have been a decline in family size even amongst the lowest occupational groups.

A similar study was made by Kennedy in Edinburgh in 1933.[1] He collected records of 10,000 cases in the gynæcological wards of the Edinburgh Royal Infirmary, and from his data Pearl[2] computed the percentages shown in the following table.

TABLE 56.   First-born children per cent of all live-born children

Age of mother	Bristol, 1932	Bristol, 1937	Edinburgh, 1933
Under 25	69·0	70·5	63·8
25–34	35·7	40·2	28·8
35–44	8 9	11·8	18·8
Over 45	.	7·7	9·9

Pearl was surprised at the high percentages obtained by Kennedy, and thought that this was due to the fact that Kennedy used gynæcologically defective material, among which he expected to find a preponderance of primiparae. The Bristol figures suggest that but for the age groups 35 and over Kennedy's figures under-estimate rather than over-estimate the percentage of primiparae in the different age groups. Women over 35 who experience their first pregnancy are probably more apt to go to hospital for their delivery, so that the higher percentage in those age groups may be explained by that fact.

In Table 57 we show children of various parities as a percentage of all live-born children.

TABLE 57.   Children of various parities per cent of all
live-born children, Bristol

Age of mother	1932				Parity	1937			
	1	1–3	4–8	Over 9		1	1–3	4–8	Over 9
15–19	93·84	100·00	.	.		91·07	100·00	.	.
20–24	65·74	98·75	1·26	.		67·90	98·36	1·63	.
25–29	45·34	89·75	10·19	0·06		48·52	90·50	9·49	.
30–34	23·04	67·07	31·48	1·45		29·08	75·05	24·24	0·70
35–39	11·00	41·53	50·18	8·27		13·90	52·19	40·43	7·38
40–44	3·26	20·52	56·68	22·80		5·65	28·64	47·18	24·19
45–49	.	11·11	61·11	27·79		7·69	12·81	41·03	46·15

We may disregard the percentages in the first and last age groups as being subject to large fluctuations. In almost all the other age groups we observe

1 Kennedy, 'The Menarche and Menstrual Type', *Journ. Obst. and Gyn. Brit. Empire*, 1933, p. 792.
2 Pearl, *The Natural History of Population*, Oxford, 1939, p. 133.

an increase in the proportion of first, second and third births. There have been substantial decreases in the proportion of children of parity order 4 to 8, but the percentage of children of very high parity order has held its own. This suggests that there is a number of persons who are liable to have large families and who do not seem to be influenced much by external conditions. This problem will be dealt with in greater detail in the section devoted to differential fertility.

In Table 58 mean parities for various age groups have been computed. The concept of mean parity has no well-defined meaning when taken by itself, but it might be useful for purposes of comparison, especially for comparison between different occupational groups. Between 1932 and 1937 there has been a decrease in mean parities in all age groups except the first and the last, which are known to be subject to large fluctuations.

TABLE 58.   Mean parities at various ages, Bristol, 1932 and 1937

Age of mother	1932	1937
15–19	1·07	1·10
20–24	1·44	1·42
25–29	1·95	1·88
30–34	3·04	2·65
35–39	4·49	4·00
40–44	6·13	5·81
45–49	6·78	7·51
All	2·72	2·40

In this case the increase in the last age group may be explained, as there was a larger number of births to women aged 45 to 49 in 1937 than in 1932. As these births tend to be of a high parity order, the average for this group has been raised.

In Table 59 we give the dispersion of mothers' ages about the mean parity ages, as measured by the standard deviation. If $\sigma/\sqrt{2n}$ is taken as the standard

TABLE 59.   Standard deviations of mothers' ages about mean parity ages

Parity	1932	1937	Difference / St. error of diff.
1	4·60	4·69	1 00
2	4·76	4·78	0·17
3	4·95	4·99	0·22
4	4·91	4·83	0·35
5	4·61	4 96	1·21
6	3·99	4·49	1·52
7	4·17	4·25	0·21
8	3·56	4·43	1·81
9	3·42	3·94	0·96
10	3·51	3·84	0·40
11–	2·98	3·06	0·20
All	5·98	5·83	1·88

error of the standard deviation, none of the dispersions has changed significantly between 1932 and 1937. These dispersions will be valuable for comparison with those found in the different occupational groups.

6. *Differential fertility—description of the material*

So far we have been concerned with the fertility of the Bristol population as a whole, and we have utilized the material available in the Bristol Births Notifications Register. We shall now attempt to investigate differences in fertility among the different occupational groups in Bristol. In order to do this we have had to use information collected by the Health Visitors employed by the Maternity and Infant Welfare Department of the Corporation of Bristol.

The Health Visitors visit every child born in the city at least once, and in the great majority of cases they continue regular visits until the child reaches the age of 5 and passes from their care into that of the School Medical Service. In a number of cases the families of the children are classified as O.V.S., or 'over visiting standard', and no further visits are then made. As a rule O.V.S. families are middle-class families. The Health Visitors have no compulsory powers of entry, and in some cases they are refused admission to the houses. But it says much both for the tact and the skill of the Health Visitors that the proportion of refusals is very small and appears to be diminishing.

The Health Visitor keeps a record card for each family she visits, and proceeds to complete this card during the course of her visits. From these cards we have extracted certain social and medical data. For our purposes the most important one is the occupation of the father. It is these data that we shall be using in the rest of this paper. Unfortunately some mothers appear to resent giving this information, and as it is the primary duty of the Health Visitor to look after the child's welfare, and not to collect statistics, she may not press for information, for fear of being refused entry the next time she calls. Some of the record cards were therefore incomplete. Information is especially scanty where the occupation of the father is concerned, and we have this information in about 50 per cent of the cases only.

Apart from the incompleteness of the records there are a number of cases where the entry in the birth register cannot be matched with a corresponding entry in the files of the Maternity and Infant Welfare Department. Apart from the O.V.S. families which we have already mentioned, no information exists about stillborn children, children who have died before the investigation was made,[1] or children whose parents have moved outside the city's boundaries. Moreover, the department occasionally loses track of one family moving from one part of the city to another. In investigating the records we are not, therefore, dealing with the population as a whole, but with a sample of live-born children, born in Bristol in 1937 and surviving into 1939.

Is this sample likely to be a random sample? Unfortunately we can make no tests to answer that question. But certain considerations must be taken into account. In the first case the Health Visitor is likely to be more inquisitive if the standard of living of the family is low, for it is in these cases that the social environment of the child becomes important from the point of view of

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1 That is to say, children who died under the age of 2 years. This is a big gap, especially as no information is available about infantile and neo-natal deaths beyond the purely biological information given in the Birth Register.

its medical progress. And, in the second place, there is a tendency for people to be more reticent about their private affairs the higher they stand on the social ladder. We should therefore expect to have more information about families at the lower end of the social scale, and this slight downward bias must be borne in mind when the results of the sample are interpreted.

We have used the occupational code of the Bristol Social Survey, reprinted in Appendix 4. This code is almost identical with that of the Merseyside Social Survey. But we did not have the same information that the Bristol Social Survey investigators had when they came to code their occupations. In particular we had no information whatever about wages, and some small differences in coding are inevitable.

The Bristol Social Survey Code has 10 occupational classes. This is too large a number for the purposes of this paper, and we have condensed them into five as follows:

```
0123 = middle class and clerical.
  45 = minor commercial, shopkeepers and shop assistants.
  67 = workmen in supervisory positions and skilled artisans.
   8 = semi-skilled workers.
   9 = unskilled labourers.
```

In Table 60 we show the percentages in each of the last four occupational groups in our sample and in the Social Survey. We have compared the last four groups only, as the Social Survey excluded all non-manual workers earning more than £250 per annum.

TABLE 60.   Proportions in different occupational groups

Occupational group	Social survey		Population sample	
	Number	Per cent	Number	Per cent
45	294	8·77	344	13 37
67	1,051	31·35	796	30·94
8	1,180	35·20	609	23·67
9	827	24·67	824	32·02
All	3,352	100·00	2,573	100 00

It is evident from this table that we have more information about class 9 (unskilled workers) than about the other classes. This bears out the a priori considerations advanced above.

7.   Mean parity ages in different occupational groups

We may now turn to an examination of differences in fertility between different occupational groups. For this purpose we have constructed tables showing the number of births to mothers whose husbands are known to be in certain occupational groups. These births have been tabulated by the age of the mother and by parity order. Mean parity ages have been computed in all cases where the number of births of a given parity order exceeds 25. If the number fell short of 25 the sampling error would become so large that no reliance could be placed on comparisons. The relevant information is given in Table 61. The figures below each mean parity age gives its standard error.

TABLE 61. Mean parity ages in different occupational groups

Occupational group	Parity			
	1	2	3	All
0123	27·95	30 50	31·91	29 64
	0 40	0 42	0 89	0·30
45	27·06	29 64	31·73	29·34
	0·37	0 43	0·70	0·28
67	26 19	28 80	30·94	28 51
	0·23	0·33	0 45	0 19
8	25·98	28 72	31·11	29·15
	0 30	0 35	0·58	0·24
9	24 56	27·60	29·63	30 10
	0·30	0·32	0 47	0 23
All	26 41	29 07	31 04	29 31
	0 09	0·12	0·18	0 08

If we concentrate our attention on mean parity ages at parity 1 we see that there is a pronounced fall in the mean age as we go down on the social scale. If there were no interference with fertility by birth control or similar means the age at first delivery would serve as an index of the age at marriage. As we know that birth control is in fact being practised, and as no statistics for differential age at marriage are available, we cannot analyse the relative importance of these two factors. We shall have to be content with establishing the fall in the age at first delivery that occurs in the lower occupational groups.

In Table 62 the ratio of the difference in age at first delivery in different occupational groups to its standard error is tabulated. This table exhibits some interesting results. The most, striking of them is that the differences between group 9 and all other occupational groups are significant. There appears to exist a real difference between the average age at first delivery of labourers' wives and that of all other women. We have mentioned above that our sample may be biased in a downward direction—that is to say, there may be a tendency for labourers who are in the lower section of group 9 to be selected. But if we accept the measure of dispersion given by the standard deviation of the distribution of the mothers' ages as correct, we find that the difference between group 8 and group 9 would have to be reduced by 0·58 or by 41˙per cent of itself in order to become statistically insignificant. The difference seems undoubtedly to be a real one.

TABLE 62. Ratio of differences in mean parity ages at parity 1
to their standard error

Occupational group	45	67	8	9
0123	1·65	3·83	3·94	6·78
45	.	1·98	2 25	5 21
67	.	.	0·55	4·29
8	.	.	.	3 38

At the other end of the scale the average age at first delivery in the highest group (0123) is significantly different from the corresponding average ages of all but the next highest group (45). The age at first delivery in group 45 differs significantly from the corresponding ages in groups 8 and 9, and the difference between it and group 67 is almost significant. One might conclude that there

is a significant difference in the average age at first delivery between the middle
and shopkeeping classes on one hand and the manual workers on the other.

The spread of the births around the mean age, as shown by the standard
deviation of the distribution of mothers' ages, is given in Table 63. At parity 1
it does not seem to differ much between different occupational groups.

TABLE 63.   Standard deviation of mothers' ages at given parities in
different occupational groups

Occupational group	Parity			
	1	2	3	All
0123	4 65	3·70	4 65	4·77
45	4 54	4·51	4·86	5·19
67	4 50	4·86	4·47	5 39
8	4 69	4 61	5·22	5·96
9	4·32	4 33	5 04	6·58

As regards second births, the same trend holds. If we construct a table
similar to Table 62 for second births, it is seen that the differences between
group 9 and all other groups are again significant. The differences between
the highest group and all manual workers' groups are significant, but there
appears to be no significant difference between the shopkeeping class and the
upper working-class groups. The low value of the standard deviation in
group 0123 should in my opinion be ascribed to chance.

TABLE 64.   Ratio of difference of mean parity ages at
parity 2 to its standard error

Occupational group	45	67	8	9
0123	1·43	3·21	3·24	5·47
45	.	1·56	1·67	3·78
67	.	.	0·17	2·61
8	.	.	.	2·38

A similar analysis may be made for parity order 3, although the standard
errors tend to become larger there. The results are shown in Table 65.

This table is even more striking than the previous ones. In spite of the
much larger size of the standard error, group 9 still stands quite distinct from
all the other groups. (The difference between group 8 and group 9 just fails
to be significant, but the chance of a difference of $1·97\sigma$ or larger is 0·04884.)
The distinction between group 9 and the other groups is emphasized by the
fact that none of the other differences are significant.

TABLE 65.   Ratio of difference of mean parity ages at
parity 3 to its standard error

Occupational group	45	67	8	9
0123	0·16	0·97	0·75	2·26
45	.	0·95	0·68	2·50
67	.	.	0 23	2·02
8	.	.	.	1·97

If the average age of all mothers in different occupational classes be com-
pared, it is seen that it tends to fall as we go down from group 0123 to group 67,

but that it rises again in groups 8 and 9. This is due to different weights being given to the elements making up the average, the proportion of children of high parity order who tend to be born to mothers of higher age groups being larger in groups 8 and 9. A comparison of means would therefore be useless; the percentages in various parity groups will have to be investigated. This will be done in the next section. But it might be profitable before proceeding to this investigation to compare the standard deviations of mothers' ages in different occupational groups. A glance at Table 63 shows that they tend to become larger in the lower occupational groups. Taking the standard error of the standard deviation to be $\sigma/\sqrt{2n}$, we can construct a table similar to Tables 62, 64 and 65 in which the ratios of the differences of the standard deviations to their standard errors are shown. This is done in Table 66.

TABLE 66.   Ratio of the differences of the standard deviations in different occupational groups to their standard error

Occupational group	45	67	8	9
0123	1·45	2·48	4·41	6·96
45	.	0·83	2·96	5 35
67	.	.	2·71	5·67
8	.	.	.	2·70

Again group 9 stands apart from all others, and group 0123 is significantly different from all other groups except group 45. It should be noted, however, that in this case there is a distinction between group 8 and higher social classes. The standard deviations are related to the range of the distributions, and they might be taken as a very rough index of the length of the actual as distinct from the potential child-bearing period. Taking the standard deviation of group 0123 as 100, we find that the standard deviations in groups 45, 67, 8 and 9 become 109, 113, 125 and 138 respectively. The spread of mothers' ages in group 9 is higher by about 40 per cent than that in group 0123. This is an indication that the actual child-bearing period of an unskilled labourer's wife is materially higher than that of a woman of the middle classes.

From this section the following conclusions emerge: The age of the mother at first, second and third delivery decreases with occupational status of the husband, and the average ages in the lowest occupational group (group 9), especially, differ significantly from those of all the other groups. The average age of all mothers decreases with a decrease in the husband's occupational status, but rises again in groups 8 and 9 mainly because of the greater incidence of births of high parity order in these groups. The standard deviation of the age distribution of the mothers increases with a decrease in occupational status, signifying a longer active child-bearing period among women whose husbands are in a low occupational group.

8.   Parity patterns in different occupational groups

The different parity patterns in the occupational groups are illustrated by Table 67, showing the proportion of children of various parity orders in the different occupational groups of the population.

TABLE 67.   Proportion of children of various parity orders

Parity	0123	45	67	8	9
1	52·11	43·31	47·24	40·07	25·00
2	29·12	32·85	26 51	27·91	22·33
3	16·73	13·95	12·31	13·46	13·83
4	4·21	4·65	7·91	9·52	9·71
5	1·53	2 62	2·64	3·61	9·47
6	1·15	0·87	1·26	1·15	5·83
7	0·38	0·87	0·75	1·81	4·25
8	0 77	0·29	0·75	0·33	1·94
9	.	.	.	0 66	2·43
10	.	.	0·38	0·82	2·18
11–	.	0·58	0·25	0·66	3·03
All	100·00	100·00	100·00	100·00	100 00

Again group 9 exhibits a completely different pattern from all other groups. The proportion of first-born children, which is about the same in groups 0123, 45 and 67, drops in group 8 to 40 per cent and in group 9 to 25 per cent of all children. Group 9 differs even from group 8, and the proportion of children of high parity order is much larger in that group than in any other group. In order to see whether any of these differences could have arisen from sampling fluctuations, we have applied the χ^2 test to each pair of distributions. The values of χ^2 are given in Table 68. For 10 degrees of freedom a χ^2 of 21·161 corresponds to a P of 0·02 and a χ^2 of 23·209 to a P of 0·01. Thus group 9 again differs from all other groups, and only one other difference (that between group 0123 and group 8) is significant. The size of the χ^2 obtained from a comparison of group 9 with other groups is of quite a different order of magnitude from all the other χ^2s in the table.

TABLE 68.   Values of χ^2

Occupational group	45	67	8	9
0123	8·05	8·79	25·40	114·87
45	.	11·63	16·38	109·04
67	.	.	18·78	187·38
8	.	.	.	101·07

A similar result is obtained when mean parities for various age groups are considered. These are shown in Table 69.

TABLE 69.   Mean parities in different occupational groups

Age of mother	0123	45	67	8	9	All
15–19	1·00	1·00	1·04	1·20	1·04	1·10
20–24	1·15	1·43	1·37	1·47	1·67	1·42
25–29	1·62	1·69	1·83	1·98	2·47	1·88
30–34	2·09	2·23	2·48	2·53	4·15	2·65
35–39	2·85	3·21	3·57	3·64	5·58	4·00
40–44	2·20	4·78	4·86	5·62	7·39	5·81
45–49	.	1·00	3·50	8·60	9·64	7·51
All	1·83	2·02	2·07	2·37	3·55	2·40

Disregarding the figures in the first and last age groups, where the number of births is so small as to render the averages meaningless, we see that for every age group the mean parity increases as we descend the social scale. This is partly due to the differences in the age at marriage in different occupational

groups and partly to different degree of the use of contraceptives. In this connection the low value for the age group 20–24 in group 0123 is especially noteworthy. The values in group 9 are again of a different degree of magnitude from all the other values given in the table.

9. Conclusion

We have shown that the fertility habits of persons in occupational group 9 differ significantly from those of the rest of the population in Bristol when any one of three criteria is applied. The ages of the mothers at their first three confinements are lower on the average than the corresponding ages in all other groups, the dispersion of the distribution of mothers' ages is higher, and the parity pattern of the class as a whole is different from that of other classes, there being a much higher proportion of children of high parity order.

The most direct way of estimating differences in fertility would have been the calculation of net reproduction rates for different occupational groups. This was impossible in our case, as the female population in different occupational groups could not be estimated with any degree of accuracy. It was for this reason that the fertility habits of different groups had to be compared by what may be termed secondary characteristics. But all our comparisons point to the conclusion that there is a certain group with fertility habits distinct from the rest of the population and that that group consists mainly of people in occupational group 9.

The differences in parity patterns are specially significant. Mean parity may be taken as an index of family size, and mean parity is undoubtedly greater in group 9 than in other groups. The grading of group 9 as the lowest occupational group does not imply any judgment as to their social value, but it is true that unemployment and poverty are more prevalent amongst them than amongst the rest of the population. In 1937 29·7 per cent of families whose man-head was in group 9 were below the poverty line of the Bristol Social Survey,[1] as against 17·0 per cent of group 8 families and less than 10 per cent of families in other occupational groups. Thus the part of the population that is most fertile has to bring up its children in the worst environmental conditions. The Social Survey figures show[2] that 51·3 per cent of the families having more than four children under 14 years of age have an income below their standard needs, and that some 20 per cent of all children under 14 in Bristol are below the poverty line. Our figures suggest that these alarmingly high proportions are due mainly to the large number of children in the families of unskilled labourers.[3] A large amount of the distress caused could undoubtedly be relieved by a system of family allowances, and in a recent article[4] based on Social Survey data it has been shown that the cost of family allowances that would remove a great deal of the poverty would be small in relation to the total wage bill.

There remains one question. Does the method by which our sample has been selected affect our results? We have mentioned that the Health Visitor

1 H. Tout, *The Standard of Living in Bristol*, p. 49.   2 *Ibid.* p. 39.
3 Similar results were obtained in the *Social Survey of Merseyside*, vide vol. 3, ch. 21.
4 H. Tout, 'A Statistical Note on Family Allowances', *Econ. Journ.* March 1940.

will press for information more insistently when conditions in the visited family are poor. This tendency is reflected by the representation of group 9 in our sample, which is proportionately higher than the strength of that group in the general population. But there is also a large amount of distress among families of group 8, and the tendency to select people from the lower strata of that group would be as operative as in the case of group 9. Yet the differences between group 8 and group 9 are in most cases significant, and very large. It would seem that an increase in the size of our sample would not appreciably affect the differences that we have established.

APPENDIX 1.   *The calculation of the future population*

To compute the future population in five-yearly age groups, we obtain from the life-table the function $_5L_x = 2\frac{1}{2}(l_x + l_{x+5})$, which gives us approximately the numbers x to $x+5$ in the stationary population. Writing $_5p_x = {_5L_{x+5}}/{_5L_x}$, we obtain the reduction factor by which each age group must be multiplied in order to give us the population in the age group $x+5$ to $x+10$, 5 years hence.

The number of female births is obtained by applying the specific fertility rates given in Tables 41 and 44 to the number of women in the relevant age groups. The relevant number of women is estimated by averaging the number of women in the age group at two five-yearly intervals. Thus, in order to obtain the births that are to give us the population aged 0 to 4 in 1942, we would estimate a female population by averaging the numbers in the different age groups in 1937 and 1942. The resulting number of births must be multiplied by $_5L_0/500,000$ in order to give us the population aged 0 to 4 in 1942.[1]

Male births are computed by assuming the sex ratio at birth to remain at the 1937 level, when 51·45 per cent of all live births were males. The number of females born is thus multiplied by $51·45/48·55 = 1·0597$ to give us the number of males born.

The formula $_5L_x = 2\frac{1}{2}(l_x + l_{x+5})$ is an approximate formula, and assumes that the rate of mortality remains approximately constant over a five-yearly period. This assumption is not fulfilled in the 0 to 4 age group, where mortality at the beginning of the period is very much heavier than during the latter part. An error is thus introduced into our calculations, but in view of their hypothetical nature, it was not thought worth while to use a more accurate method.

APPENDIX 2.   *The stable population*

Denoting the yearly real rate of increase by r, and writing R_0 for the net reproduction rate and m_1, m_2, m_3, m_4 for successive semi-invariants of the net fertility schedule, we have:

$$-rm_1 + \frac{1}{2!}r^2m_2 - \frac{1}{3!}r^3m_3 + \frac{1}{4!}r^4m_4 = -\log_e R_0.[2]$$

1 For a short account of the method see D. V. Glass, 'European Population Movements in the Union of South Africa', *South African Journ. of Econs.* vol. 7, No. 1, pp. 49–51.
2 E. C. Rhodes, 'Population Mathematics', *Journ. Roy. Stat. Soc.* Part 2, 1940; A. Lotka; *Analyse démographique*, p. 69.

Having computed r from the net fertility schedule, we may compute the stable age distribution, by using the following formula:

$$c(a) = \frac{e^{-ra}l(a)}{\int_0^A e^{-ra}l(a)da},$$

where $c(a)$ is the proportion of people aged a in the stable population, and where $l(a)$ is the l_x of the life-table and A the upper limit of age of the population. Applying these formulae to the net fertility schedule we obtain:

$$r = -0\cdot01148.$$

The stable age distribution is shown in the table below:

Age	%	Age	%	Age	%	Age	%
0–4	4·8	25–29	6·0	50–54	7·0	75–79	4·4
5–9	5·0	30–34	6·3	55–59	7·0	80–84	2·6
10–14	5·2	35–39	6·5	60–64	6·9	85–89	0·9
15–19	5·5	40–44	6·8	65–69	6·5	90–94	0·1
20–24	5·8	45–49	6·9	70–74	5·7		

APPENDIX 3. *Age of mother and parity order of live-born babies, Bristol, 1932*

Age of mother	1	2	3	4	5	6	7	8	9	10	11–	Un-known	Total
15	2	.	.	.	.	.	.	.	.	.	.	.	2
16	3	.	.	.	.	.	.	.	.	.	.	.	3
17	19	1	.	.	.	.	.	.	.	.	.	.	20
18	35	2	1	.	.	.	.	.	.	.	.	1	39
19	78	5	.	.	.	.	.	.	.	.	.	1	84
20	105	25	2	.	.	.	.	.	.	.	.	2	134
21	130	45	7	.	.	.	.	.	.	.	.	4	186
22	154	44	12	1	.	.	.	.	.	.	.	9	220
23	148	84	26	3	.	.	.	.	.	.	.	9	270
24	196	91	32	9	1	.	.	.	.	.	.	12	341
25	182	119	39	16	5	.	.	.	.	.	.	16	377
26	195	100	43	21	4	.	1	.	.	1	.	21	386
27	167	102	52	22	7	3	.	.	.	.	.	14	367
28	131	104	35	21	16	6	1	.	.	.	.	21	335
29	104	110	59	24	14	10	4	.	.	.	.	22	347
30	92	89	58	38	26	11	3	.	1	.	1	14	333
31	78	72	50	27	22	18	5	1	.	.	.	16	289
32	60	87	57	27	26	22	7	6	2	.	.	20	314
33	43	50	38	29	25	12	7	8	3	3	.	12	230
34	30	46	32	36	23	20	8	7	7	2	.	12	223
35	31	44	26	30	16	15	10	13	4	6	2	11	208
36	16	23	30	32	26	19	10	8	5	2	3	9	183
37	14	20	27	18	13	15	14	7	13	1	2	7	151
38	13	19	25	16	21	15	12	9	3	2	3	9	147
39	15	15	18	17	22	26	10	12	4	9	8	7	163
40	3	8	15	9	13	7	11	8	5	7	9	7	102
41	3	7	5	12	12	8	8	4	3	5	3	4	74
42	1	8	4	8	10	4	11	6	4	1	10	5	72
43	2	2	2	5	5	4	11	6	3	4	6	.	50
44	1	1	1	5	2	1	.	4	2	1	7	1	26
45	.	.	2	1	3	.	1	2	.	1	2	1	13
46	.	.	.	1	.	.	.	.	1	.	1	.	3
47	.	.	.	.	1	.	.	.	.	.	.	1	2
48	.	.	.	.	.	1	.	.	.	.	.	.	1
49	.	.	.	.	.	.	1	.	.	.	.	1	2
Unknown	26	43	21	13	2	3	4	.	.	2	1	79	194
Total	2,077	1,366	719	441	315	220	139	101	60	47	58	348	5,891

Age of mother and parity order of live-born babies, Bristol, 1937

Age of mother	1	2	3	4	5	6	7	8	9	10	11-	Un-known	Total
15	1	.	.	.	.	.	.	.	.	.	.	.	1
16	6	.	.	.	.	.	.	.	.	.	.	.	6
17	24	2	.	.	.	.	.	.	.	.	.	.	26
18	43	4	1	.	.	.	.	.	.	.	.	1	49
19	79	7	1	.	.	.	.	.	.	.	.	.	87
20	125	23	1	.	.	.	.	.	.	.	.	.	149
21	177	47	8	.	1	.	.	.	.	.	.	1	234
22	187	58	10	3	.	.	.	.	.	.	.	1	259
23	225	79	23	3	1	.	.	.	.	.	.	3	334
24	200	115	46	9	5	.	.	.	.	.	.	1	376
25	209	86	40	17	8	1	.	.	.	.	.	1	362
26	195	106	48	19	5	1	1	.	.	.	.	3	378
27	197	124	44	22	8	3	.	1	.	.	.	2	401
28	150	120	50	29	7	2	.	1	.	.	.	2	361
29	169	114	64	29	17	4	4	1	.	.	.	2	404
30	122	93	55	31	21	13	4	2	2	.	.	.	343
31	91	77	36	22	12	4	4	2	.	1	.	3	252
32	81	102	53	35	27	14	5	4	2	1	1	5	330
33	60	90	41	32	8	10	6	2	1	1	.	1	252
34	61	59	50	36	28	13	7	4	1	.	.	1	260
35	26	40	27	24	16	9	8	7	1	1	.	1	160
36	32	40	31	24	10	10	7	5	3	3	1	2	168
37	22	32	33	30	17	13	13	6	7	5	7	1	186
38	9	11	22	17	13	6	8	5	5	2	2	1	101
39	9	15	19	8	8	10	8	3	5	3	7	.	95
40	7	15	12	10	11	7	8	4	3	4	12	.	93
41	2	3	10	8	5	5	6	3	2	5	3	.	52
42	2	6	3	6	5	4	3	3	4	5	6	.	47
43	2	2	5	3	3	3	5	1	1	3	3	1	32
44	1	1	.	2	4	6	2	.	1	.	8	.	25
45	3	1	1	2	1	.	3	1	.	2	5	.	19
46	.	.	.	1	1	.	1	2	.	3	5	.	13
47	.	.	.	.	.	1	.	1	1	.	.	.	3
48	.	.	.	.	1	.	.	.	.	1	.	.	2
49	.	.	.	1	.	.	.	.	.	1	.	.	2
Unknown	24	20	8	6	4	.	.	.	.	.	1	5	68
Total	2,541	1,492	742	429	247	139	103	58	40	40	61	38	5,930

APPENDIX 4.   *Occupational code used*

0. *Highest Professions, Administrative, Business.* All professions and all higher administrative posts in state or business. Merchant, Consulting Engineer, Analytical Chemist.

1. *All School Teachers*, including teachers of Art, Music and Domestic Science, Physical Training and Kindergarten.

2. *Lower Professional, Commercial, Technical and Managerial.* Chemists, Clerks (special training or experience), Commercial Travellers, Customs Officers, Engineers (good class street), Farmers, Market Gardeners, Licensed Victuallers, Master Mariners, Pilots (1st class), Trained Nurses (sick or children's), Police Inspectors, Relieving Officers, Sanitary and Building Inspectors, Shopkeepers (Proprietors and Supervisory Assistants), Trained Library Assistants, Reporters.

3. *Ordinary Clerks*, including G.P.O., Municipal, Insurance, Shipping, Telephone Operators, Draughtsmen, Cashiers, Secretaries.

4. *Insurance and other Agents.* Motor Salesmen, Furniture Salesmen, Typewriter Salesmen, Commercial Travellers (in a small way), School Attendance and Assistant Relieving Officers.

5. *Shop Assistants, Minor Commercial.* Small Shopkeepers, Dealers (in a small way), Fish, Fruit or Vegetable Roundsmen (on own account), Coal Merchant, Manager of Branch Shops, Trade Union Official, Assistant Manager, Canvasser.

6. *Manual Worker in Supervisory Position.* Foreman, General Contractor (own account, employing a few others), Haulage Contractor, Boatswain, Chief Steward, Dock Official, Park Superintendent, Police Sergeant, Pilot (2nd or 3rd class), Head Warehouseman, Railway and Bus Inspector.

7. *Skilled Manual Worker.* Plumber, Fitter, Boilermaker, Carpenter, Painter, Engine-driver, Chef, Policeman, Working Engineer, Bookbinder, Coppersmith, French Polisher, Mason, Oven-builder, Piano-tuner, Plasterer, Signalman, Sign-writer, Watchmaker, Wheelwright, Bricklayer, Tiler, Compositor, Lithographer, Press Minder, Upholsterer, Hairdresser, Passer, Checker, Printer, Colourman, Beater, Typecaster, Tile Slabber, Boot Repairer, Turner, Lens Surfacer, Colour Matcher, Sculptor, Brass-finisher, Rounder, Varnish-maker, Tailor, Cooper, Electric Welder, Riveter, Brushmaker, Iron Moulder, Stevedore, Yeast Separator, Confectioner, Steeplejack.

8. *Semi-skilled Manual Worker.* Barman, Carter, Domestic Servant, Factory Worker, Fireman, Gardener, Laundry Worker, Motor-driver, Parkkeeper, Postman, Bus Conductor, Guard, Cinema Attendant, Male Nurse, Furniture Remover, Meter Tester, Chimney Sweep, Storekeeper, Bus and Tram Driver, Bricksetter, Roundsman, Fryer, Demolition Labourer, Cranedriver, Waiter, Soldier, Foundry Assistant.

9. *Unskilled Manual Worker.* Docker, Seaman, Labourer, Hawker, Watchman, Stop and Go Man, Lamplighter, Pointsman, Setter, Porter, Loader, Fettler, Scavenger, Craftsmen's Helpers—e.g. Builder's Labourer, Electrician's Mate, Cellarman, Rag-and-Bone Man.

CHAPTER IV. SUMMARY: FUTURE ESTIMATES OF POPULATION

By E. Grebenik

The method generally used in measuring population trends is the calculation of the so-called natural increase of the population. It consists in relating the number of births and deaths to the total population, thus obtaining birth- and death-rates. Their difference is then called the natural increase or decrease of the population, as the case may be. This method suffers from the great disadvantage that the death-rate and the birth-rate are not independent of the age composition of the population in question. Thus, a town in which there is a large proportion of old people, among whom mortality is high, will have a high death-rate, and a town in which there is an abnormally large proportion of women between age 20 and age 30 will have a birth-rate above the average. These factors have to be allowed for when the natural increase in the population is measured.

The correct measurement to use in order to find out whether the population is replacing itself is the so-called net reproduction rate. Broadly speaking this measure tells us the number of female children that 1,000 girls born now will produce for the next generation, if fertility and mortality remain the same. Thus, a net reproduction rate of 1 means that 1,000 girls born now will during their child-bearing period produce 1,000 girls in the next generation, i.e. the population is just maintaining itself. A net reproduction rate of less than unity means that they will produce less than 1,000 girls in the next generation and that the population is going to decrease. A net reproduction rate of more than unity would mean that the population is going to increase.

In order to compute a net reproduction rate we need to know the ages of the mothers to whom daughters are born. This information has not been available for the country as a whole, before 1938, but in Bristol the Medical Officer of Health has kept the necessary particulars for some time previously. Hence a net reproduction rate can be calculated for the city of Bristol.

The first step in such a calculation is the construction of a life-table such as is used by Life Insurance Companies in the calculation of their premiums. Such a life-table tells us how many of 100,000 people born now will survive to their 1st, 2nd, 3rd, etc. birthdays. The construction of a life-table for the whole country is undertaken every 10 years by the Registrar-General, but the construction of a life-table for a particular city is complicated by the fact that not all the necessary statistics are printed. The life-table that I have constructed for Bristol is, therefore, in the nature of an estimate, but the results would seem to indicate that, in general, Bristol is healthier than the country as a whole. Thus a comparison of the number of women surviving to stated ages in Bristol according to my calculations in 1932, and in England and Wales according to the Registrar-General, would give the following result:

	In Bristol	In England and Wales
Out of every 1,000 women born now there survive to age 10	927	911
20	911	894
30	885	868
40	856	837
50	802	790
60	713	702
70	557	531
80	271	249

We can also calculate the number surviving to age 15, when the child-bearing period may be presumed to begin. That number is 922. Thus out of every 1,000 girls born now 78 will die before the age of 15, and will not, therefore, take any part in reproduction.

The next step is to find the number of girls born at present to women of certain ages. This is shown for 1932 in Table 41, Chapter III, from which the following proportional figures are taken.

To every 10,000 women aged	15–19	there were born alive	40	girls each year
,,	20–24	,,	295	,, ,,
,,	25–29	,,	517	,, ,,
,,	30–34	,,	413	,, ,,
,,	35–39	,,	274	,, ,,
,,	40–44	,,	115	,, ,,
,,	45–49	,,	4	,, ,,

Thus, if all these 10,000 women survived to age 49, there would be born to them 1,658 live girls every year. But as each woman spends 5 years in each age group, this number must be multiplied by five in order to get the total number of girls born to them. This number is 8,290. But as some of these women will die before reaching the age of 50, we must make allowances for them. Out of every 10,000 girls born now only 9,170 will survive to age $17\frac{1}{2}$, the mid-point of the first age group, and to them will be born only 37 girls instead of the 40 that would have been born if they all survived to that age. Carrying out similar reductions for all age groups, we find that allowing for deaths during the child-bearing period, 10,000 girls born now will produce only 7,322 girls in the next generation. The net reproduction rate is thus 0·732, i.e. the population is not reproducing itself. The estimated net reproduction rate for England and Wales at that time was 0·807, i.e. Bristol's rate was 10 per cent below the national rate, in spite of the fact that less women died during the child-bearing period in Bristol than they did in England and Wales as a whole. In order to bring the net reproduction rate up to unity, it would be necessary for 1,062 more girls to be born each year. In 1932 there were 2,894 female births actually occurring in Bristol, and the necessary increase would, therefore, be one-third. A similar calculation carried out for 1937 showed a net reproduction rate of 0·712, i.e. the rate had fallen further since 1932.

The net reproduction rate can only show us that the population is bound to decrease in the future; it does not show us the actual movement of the population. It is, indeed, conceivable that although the net reproduction rate is below unity the population will increase for a little while because there

have been born in the past a larger number of children, who are now in their most fertile period. This phenomenon did actually take place in Bristol, for though the net reproduction rate was below unity in 1932, the population has continued to rise. But if the rate continues below unity that rise cannot be maintained.

In order to calculate the future population on the assumption that fertility and mortality remain the same, we must compute so-called survival factors from the life-table. These will show the proportion of people in a certain age group (say 15–19), who will still be alive in five years' time and will then form the next highest age group (in this case 20–24). These survival factors can be applied to the actual population, and we can calculate the survivors in five years' time. As we also know the number of children born to women of certain ages, we can forecast the number of female births during the next five years. This number must be reduced by a special survival factor, to allow for the fact that of the children born next year some will have died before they reach the age of 5. The births reduced by the survival factor will give us the population aged o to 4 years in five years' time. This process can be continued as far as we please, and in Table 49 of Chapter III I have given figures of the total estimated population of Bristol during the next 65 years. This table is reproduced below. (The population is given in thousands.)

Year	Males	Females	Total	Year	Males	Females	Total
1937	194·5	220·6	415·1	1972	178·8	192·1	370 9
1942	196·4	221·1	417·5	1977	172·5	183·6	356·1
1947	196·7	220·0	416 7	1982	165·4	174·7	340·1
1952	195·5	217·2	412·7	1987	157·8	165·4	323·2
1957	192·9	212·7	405·6	1992	150·0	156·2	306·2
1962	189·0	206·8	395·8	1997	142·1	147·3	289 4
1967	184·3	199·8	384·1	2002	134·5	138·9	273·4

This table shows that the population will reach a maximum between 1942 and 1947 and will begin to decrease thereafter. In 65 years' time Bristol will have only about 273,000 inhabitants as against 415,000 at present. It should be emphasized that these estimates are of a hypothetical nature and depend on fertility and mortality remaining constant at the 1937 level. It is very unlikely that fertility and mortality will actually remain at the level, but any change can then be gauged from the discrepancy between the observed and the calculated population. I have also neglected migration in this study, and no doubt migration will influence the future population of the city to some extent. But no estimate can be made of the future course of all these factors.

A mathematical analysis of the future course of population shows that if a population is subject to constant fertility and mortality rates it will ultimately settle down to a stable rate of decrease, and will also have a stable proportionate age composition. The stable rate of decrease and the stable age composition for females have been calculated. After about 65 years the population will reach a stable rate of decrease of 1·15 per cent per annum. In the stable population children will account for 15·0 per cent, people of working age for 64·8 per cent and old people (65 and over) for 20·2 per cent of the total population. In such a population the number of children will actually fall short of the number of older people.

The number of children will fall faster than the population as a whole, for the low fertility rate will have a small number of births among its first effects. Here is the estimated number of schoolchildren (aged 5 to 14) in the future, assuming 1937 mortality and fertility rates:

Year	Males	Females	Total	Year	Males	Females	Total
1937	31 0	30·2	61·2	1972	20·7	20·1	40 8
1942	28 5	27·6	56 1	1977	19·7	19 0	38·7
1947	27·8	26 7	54·5	1982	18 7	18·0	36·7
1952	26·5	25 7	52·2	1987	17 7	17·2	34·9
1957	25·1	24·3	49·4	1992	16 7	16·1	32·8
1962	23·5	22·7	46·2	1997	15 6	15·2	30·8
1967	22·0	21 3	43·3	2002	14 8	14·3	29·1

Thus the total number of schoolchildren will fall from 61,200 in 1937 to 29,100, or less than half the present number, in 2002. This decrease in the population will have large effects on the different social services to be provided. If there is no reverse in the fertility trend, there will be a smaller amount of pressure on the Maternity, Child Welfare and School Services, and an increased pressure on social services providing for the aged. There are a variety of other effects of a declining and ageing population, which it would take too much space to enumerate.

It would also be interesting to find whether there are any differences in fertility habits of the different social classes. It would be best to calculate the net reproduction rates for different social classes, but this is impossible because the necessary statistics are lacking. I have, therefore, been forced to adopt indirect methods of measuring such differences. For instance, I have compared the average age of the mother who has her first baby in different social classes. This is 27·95 years in the middle class, 26·19 years in the skilled working class and 24·56 years in the unskilled working class. All these figures relate to 1937. The differences are seen to be large, but there is the possibility that 1937 might have been an abnormal year, or that the sample that we have taken is biased and that there is really no class difference. In order to test this difference we can use a statistical test which tells us whether the observed difference is or is not likely to be due to errors of sampling. Applying this test we find that the chance that the difference between the average age of the unskilled working class and the average age of any other social class is real to be greater than 399/400. That is to say, in the language of the turf the odds are, at least, 399 : 1 against the difference being accidental. Similar differences are observed for the average age of the mother when she has her second or third child. It was concluded, therefore, that unskilled workers tend to have their children earlier than any other group of the population. Again, the proportion of children of a high parity order (that is to say, the proportion of seventh, eighth or ninth children, etc.) was 1·15 per cent among the middle class, 2·13 per cent among the skilled workers, and 13·83 per cent among the unskilled workers. Conversely, the proportion of first children born was 52·11 per cent among the middle class, 47·24 per cent among the working class, and only 25·00 per cent among the unskilled working class. We conclude, therefore, that the greater part of the increase in the population is due at the present time to the unskilled worker.

While the impact of the War may lead to some modification in the conclusions of these pre-war studies, the prevailing long-term trends which they reveal will still carry important implications. Amongst the more obvious are:

(i)   Approach of a stationary or declining population.
(ii) Variations in fertility habits of different social classes.
(iii) Changes within local areas due to the operation of migratory forces attracted by new industries.

The bearing of (i) and (ii) upon the future policy of Local and Central Authorities hardly requires comment. The discussion of a sewage scheme based on a future population of one million some years ago is but one instance of how far public opinion may be misled for lack of information. Such figures have a bearing on the future provision of schools, housing, transport services and in fact most of the social services. The aircraft industry afforded a striking example of (iii) even before the War. The mushroom growth from 4,000 to 14,000 between 1934 and 1938 took place in a region where the natural growth was small. Almost one-third of the adult migrants entered this industry. As will be shown later this development has been intensified since 1938. In view of the precarious nature of this trade such concentration is bound to raise serious local problems of public and private policy after the War.

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